CONTRIBUTIONS FROM THE UNIVERSITY
OF MICHIGAN HERBARIUM, NO. 5

STUDIES OF NORTH AMERICAN AGARICS—I

BY

ALEXANDER H. SMITH

ANN ARBOR
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STUDIES OF NORTH AMERICAN AGARICS—I

THE region west of the Cascade and Sierra Nevada Mountains from Canada to the San Francisco Bay district is one of the most interesting in the United States from a general botanical point of view. To the mycologist the area offers almost unlimited opportunity for the study of the distribution, growth, and fruiting habits of fungi. It affords the most constant and favorable conditions for the fruiting of fungi to be found in the United States, as well as extremely variable conditions both as to temperature and precipitation. In certain localities these conditions exist within exceptionally short distances of each other. Consequently, it is not impossible for an investigator to study fungi in several distinctive areas at the same time.

With rare exceptions, mycological collecting is carried out as a series of disconnected field trips. This is in itself a decided handicap to any systematic floristic work, since single localities are usually visited so infrequently that knowledge of the species fruiting during any one season is of necessity incomplete. If a single locality is concentrated upon, the limitations on the time of most investigators make comparative studies of several localities impossible. As a result, knowledge of the relationship of the agaric flora to the phanerogamic flora in North America has accumulated slowly. In the eastern United States, where studies have been in progress for periods of ten to thirty years in one locality, the fruiting habits of fungi and their relationships to higher plants have become fairly well known for many of the common species. We know, for instance, that *Lactarius volemus* fruits most abundantly in open oak woods in southeastern Michigan. In the western United States only a beginning has been made on the study of the agaric flora, to say nothing of the habits and range of adaptibility of the various species.

Since 1935, with the aid of grants from the Horace H. Rackham School of Graduate Studies of the University of Michigan, I have had several opportunities to study the agaric flora of this western area in connection with my investigations on the genus *Mycena*.

The first two (26 and 30) expeditions were made to study the fall flora. On the third, carried out in 1939, the spring flora was investigated. As a result, one complete fall season and one complete spring season have been spent on the agaric flora of the Olympic Mountains of Washington. In the field work I have carried out the plan of visiting certain localities regularly, and of visiting others periodically, usually once a week. By having all of my time free to follow the development of the fungi through a given season, an unusually complete record of the species and their habits has been made, and many of the difficulties mentioned above obviated. Thus, the specimens which form the records from such expeditions, instead of representing periodic sampling over a wide area, are the results of a systematic search.

During the fall of 1935, from the middle of September to the first of November, when cold weather and snow ended the mushroom season, certain general characteristics of the agaric flora were evident. The first and most impressive was the large quantity of fruiting bodies produced by a few species. In the areas covered by second-growth conifers and alders in the region between Clallam Bay, Port Angeles, and Lake Crescent, Washington, *Boletus Lakei*, *Gomphidius roseus*, and *Gomphidius oregonensis* were exceedingly abundant. Species of *Inocybe* were almost equally prevalent. *Inocybe geophylla* var. *lateritia* and *I. geophylla* var. *lilacina* were exceptionally common, whereas the species itself was rare. Just the opposite is true in the regions where I have collected in the central and northeastern United States. Mycenas were also well represented in cut-over areas, the commonest being the short-stiped form of *Mycena atroalboides*. The genus *Russula* was represented both by a large number of individuals and species, but Lactarii were noticeably few in number. Species of *Lepiota* and *Clitocybe* were abundant, but those of *Amanita* were conspicuous by their absence. Only a few scattered specimens in this genus were found.

Generally speaking, the cut-over areas which were covered with vigorous stands of second-growth trees were far superior as fungous habitats to the dense mossy virgin forests. In the dense forests of the Humid Transition life zone most of the agarics were found

in relatively open places or along trails and roads. Proceeding from the Humid Transition zone into the Canadian and Hudsonian zones one was at once impressed by the increase in the number of fungi as the ground cover thinned out. Species of *Russula* and *Cortinarius* were dominant in the upper Canadian and Hudsonian zones in the mountains between Olympic Hot Springs, Sol Duc Hot Springs, and Lake Crescent. In general, the agaric flora of the mountain slopes with south exposures was much more luxuriant and varied than that on slopes which faced north. This difference was very evident in the V-shaped valleys around Olympic Hot Springs.

The agaric flora found during the spring of 1939 differed sharply from that of the fall of 1935. Spring in the Olympics was very prolonged in 1939, extending from March to July. As would be expected under such circumstances, the period of fruiting for many vernal fungi was greatly prolonged. In the river valleys along the western slope of the mountains, species of *Morchella* were encountered from the latter part of April (the time of our arrival in the region) to almost the end of June. The period of fruiting for the gill-fungi was equally prolonged.

In this connection a series of interesting observations was made on *Psathyrella longipes* in the Elwha River Valley near the Elwha River Ranger Station. The first collection was made June 8. At this time the species was moderately abundant. How long it had been fruiting prior to this date is not known. On June 14, after a rainy period, another crop of fruiting bodies was collected. Specimens were much more abundant on June 14 than on June 8. On June 23, after another period of favorable rains, only a few fruiting bodies were found. After still another period of favorable rains ending just after July 4, no fruiting bodies appeared. Throughout the time under consideration the temperature was remarkably constant. It is not often that one collects under ideal moisture and temperature conditions and is in a position to rule out these factors when considering the fruiting cycle of an agaric. From the above observations it is evident that *Psathyrella longipes* can produce at least three crops of fruiting bodies from established mycelia before becoming exhausted.

Another interesting feature of the vernal fungous flora of the Olympics was the progression of fruiting up the mountainsides following the retreat of the snow. Because of abundant rainfall in the Sol Duc River region during June and early July, the woods from sea level up to the snow line were moist and theoretically favorable habitats for the fruiting of fungi. Invariably, however, most of the species were encountered relatively near the snow line, usually within twenty-five yards of melting snowbanks. Since the snow persisted longer in some areas than in others, it was impossible to determine the fruiting zone by a simple measurement of altitude. In the situation described above, moisture can be ruled out as a limiting factor. It seems logical to assume that temperature and a resulting change from the dormant condition accounted for the fruiting in the above instance. In the fall (of 1935), excellent collecting was found throughout the same area. It is generally acknowledged that after the summer dry season, the fall precipitation is the determining factor, within favorable limits of temperature, for the production of fleshy fungi. This, again, can be attributed to a change from dormancy imposed by the dry summer weather. These statements are based upon only two seasons' work in the area; however, in the course of ten years of field experience, this is the only occasion when I have found any one factor constant enough over a significantly long period of time to allow it to be ruled out as a limiting factor. In central and eastern North America particularly, the seasons are relatively short, and the temperature and moisture conditions are so variable that it is difficult to learn much about the fruiting habits of agarics from a quantitative standpoint. The mycologist often merely marvels at the sporadic appearance of the various forms.

One item of particular interest in the spring flora was the exceptional abundance of species of fragile purple-brown- and black-spored agarics. The former constitute the bulk of the taxonomic considerations presented in this report. These fungi were limited largely to the river valleys and to the hardwood substrata found in such places. Although not all the species are identified as yet, the number recorded in the old genera *Psathyra* and *Psathyrella* is al-

most equal to the number previously known from temperate North America.

An interesting feature in connection with the purple-brown-spored agarics from the Pacific coast region is the large number of sterile or nearly sterile fruiting bodies encountered among various species. In eastern North America occasional sterile specimens occur in a few species, but I have never found them abundantly. From Cape Flattery, Washington, along the coast to Eureka, California, I have found sterile specimens to be common in *Hypholoma dispersum*, *Psathyrella gracilis*, and *Psathyrella frustulenta*. They have been collected occasionally in *Psathyrella coprobia*, *Psathyrella longipes*, and *Stropharia magnivelaris*. Lange (13) has reported sterile specimens in Denmark for some of the above-mentioned species. The origin and biology of a series of such forms would make a very interesting study.

The vernal *Mycena* flora was interesting both from the standpoint of the species which were not found as well as from those collected. *Mycena leaiana*, a very common vernal agaric on such trees as beech, oak, and alder in northeastern North America, was not found in the Olympics during the season of 1939. Because of the presence of favorable substrata and favorable weather conditions for fruiting, its absence seems significant. *Mycena corticola* and *Mycena inclinata* are two other ordinarily common species which were conspicuous by their absence. Most of the forty-one species of *Mycena* collected were found in the Humid Transition zone and might be considered as the remnants of the fall and winter season. The climate is usually very mild in this zone throughout the winter. About fifteen species appeared to be typically vernal and furnished some very interesting information from a taxonomic standpoint. Two previously undescribed species were found in the Hudsonian zone.

Several interesting discoveries were made in other genera. *Collybia myriadophylla* Pk. was found growing on decaying wood and debris of *Populus trichocarpa* along the Hoh and Clearwater rivers. This fungus is not common in eastern United States and apparently occurs only rarely in Europe. *Naucoria vernalis* (Pl. VII), a

fungus described by Peck from New York, was the commonest vernal agaric in the Olympics in 1939. It grew with equal luxuriance on the wood of fir, hemlock, spruce, cottonwood, and alder. In eastern North America it is rare and limited to the wood of conifers. *Hypholoma fasciculare* was also abundant on both hardwood and conifer substrata.

Certain species of flowering plants such as the thimble berry (*Rubus parviflorus*) and devil's club (*Oplopanax horridum*) are known to occur abundantly throughout the Pacific Northwest and sparingly in the region around Lake Superior. Three parallel cases of a similar type of distribution have come to my attention in the agarics. *Naucoria vernalis*, *Mycena tenax*, and *Mycena strobilinoides* are very abundant in the Pacific Northwest and have been found sparingly in northern Michigan and Ontario. It is well known that a number of flowering plants are common to both areas, and that a fairly large number of agarics have a similar distribution. The species mentioned above, however, do not appear to fall into the category of cosmopolitan plants. Such a parallel series of fungi as that mentioned above seems worthy of consideration in a discussion of the problems of plant distribution in both areas.

From an ecological point of view the Olympic Peninsula offers one of the best regions, if not the most favorable, in the United States for future investigations of fungi. Its phanerogamic flora is more limited than that of areas farther south along the coast, and in general its climate is more constant. Both of these factors act to simplify the study of the fungous flora. It is very desirable to make a thorough study of such a reasonably simple agaric flora before trying to interpret the more complicated floras which exist in northern California and in the mixed hardwood and conifer forests of northeastern North America.

Fortunately, many of the interesting parts of the peninsula are now preserved in the Olympic National Park. This assures the preservation of a truly great wilderness area for many years to come and makes possible many types of investigation not practical in land subjected to commercial development. To Mr. Preston E. Massey, Park Superintendent, and to the many rangers in

both the Park and National Forest Service, I wish to express my appreciation for permission to collect in the area and for the advice and help they always gladly gave me.

Most of the species included in the following taxonomic account were collected in the Olympics during the spring of 1939. In all, fifteen species distributed in *Collybia*, *Hygrophorus*, *Omphalia*, *Psathyrella*, and *Stropharia* are described as new. Thirty additional species in the same group of genera with the addition of *Tricholoma* are discussed critically or redescribed. Certain unusual species from Oregon and California have also been included, as well as a few from Michigan in the genus *Psathyrella*. The latter are included because of the emphasis placed on that group in this investigation.

In my interpretation of European species of fragile dark-spored agarics, I have relied particularly on the recent work of Jakob E. Lange (13). In general, the classification followed here is that of Fries. The genus *Psathyrella* Quélet, however, includes *Psathyra* Quél., the fragile species formerly referred to *Hypholoma* (with the exception of those having rough spores), and some formerly placed in *Psilocybe*. The sulcate-plicate, exceedingly fragile species formerly placed in *Psathyrella* are excluded in the above concept. These are now placed in the genus *Pseudocoprinus*. Romagnesi (22) and others have used the name *Drosophila* for the fungi I am placing in *Psathyrella*. As many investigators have realized, the fungi here placed in *Psathyrella* form a homogeneous series of species which for both practical and theoretical reasons ought to be regarded as a genus. There is, however, some difference of opinion in regard to the name which should be applied to it. Singer (23) has emended the genus *Psathyra* to include the group in question. *Psathyra* Spring published in 1818, however, antedates *Psathyra* as used in the Agaricaceae, and the name is thus untenable for a group of mushrooms. The International Rules of Nomenclature specifically recommend that in the case of nonvascular cryptogams, the type of a genus be selected so as to stabilize generic names rather than bring about numerous new combinations. The generic names which must be considered in the present instance are *Hypholoma*, *Psilocybe*, and *Psathyrella*. *Hypholoma* should be

and has been (see Kühner [10]) reserved for the species related to the common brick-cap, *Hypholoma sublateritium*, and consequently cannot be used for the genus under discussion. Since *Psilocybe* has been commonly employed for a group of slender species of the *Hypholoma sublateritium* type, its application here would violate established usage more than would the choice of *Psathyrella*. Consequently, although *Psilocybe cernua* was the first species treated by Quélet when he established the genus, it should not be regarded as the type of *Psilocybe*. The name *Psathyrella* has always been applied to the fragile type of fungus now placed in this genus and is the only remaining choice, unless certain names proposed at a later date are considered. The International Rules specifically state that simply a change in the circumscription of a genus does not allow a change in its name. *Drosophila* Quél. was a new name given by Quélet to the group of fungi here under discussion, in spite of the existence of the names he had previously established by raising the subgenera of Fries to generic rank. This procedure leads to unstable nomenclature, and the rules do not allow it. *Psathyrella* is thus the oldest valid name in complete accord with usage as well as the International Rules. *Psathyrella gracilis* (Fr.) Quél. should be regarded as the type.

The collections are deposited in the University of Michigan Herbarium, and the collection numbers cited are mine. Where iodine reactions are given, the solution used was five parts chloral hydrate, two parts water, and an excess of iodine. The tests were all made on dried material. The color names in quotation marks are taken from R. Ridgway's *Color Standards and Color Nomenclature*.[1]

The study of the specimens has involved frequent references to the types of many species described by the early American mycologists. For access to the Atkinson Collections I am indebted to Professor H. M. Fitzpatrick of Cornell University. I am indebted to Dr. H. D. House, New York State Botanist, for the opportunity to study Peck's specimens, and to Dr. F. J. Seaver of the New York Botanical Garden for access to the types of the species described by Dr. W. A. Murrill. Acknowledgment is also made to

[1] Washington, D. C.: Published by the Author, 1912.

the Horace H. Rackham School of Graduate Studies for the grant which made this publication possible.

List of Species

Collybia olympiana sp. nov. (Pl. I).—Pileus 1–2.5 cm. latus, convexus vel obtuse umbonatus, demum planus, siccus, argente fibrillosus demum glaber, sordide fuscus demum cinnamomeus; odor valde farinaceus; sapor farinaceus; lamellae adnatae, confertae, ventricosae, pallidae, demum sordide fulvae; stipes 4–6 cm. longus, 1–2.5 mm. crassus, aequalis, argente fibrillosus demum glaber et sordide fulvus; sporae 6–7×4–5μ, minute echinulatae. Specimen typicum legit prope Joyce, Washington, June 21, 1939, A. H. Smith, n. 14506, in Herb. Univ. Michigan conservatum.

Pileus 1–2.5 cm. broad, convex or with a slight obtuse umbo when young, the margin incurved, becoming broadly convex, plane, or with a low obtuse umbo and a decurved margin in age, surface covered at first by a thin coating of silvery fibrils giving the cap a silvery gray appearance, "hair brown" to pale lead color beneath the fibrils, glabrescent or remaining faintly silky, the disk becoming "mummy brown" and the margin whitish or merely "avellaneous" over all, then gradually changing to brown and finally becoming "ochraceous-tawny" over the marginal area and "cinnamon-brown" (bright reddish brown or rusty brown) over the disk, translucent striate in age and then appearing hygrophanous, fading very slowly; flesh thin, soft, concolorous with the surface, odor and taste strongly farinaceous; lamellae adnate, close (25–27 reach the stipe), 2 tiers of short individuals, broad and becoming ventricose (3 mm. ±), very pale whitish gray when young, slowly becoming sordid brown, edges even; stipe 4–6 cm. long, 2–2.5 (3) mm. thick, equal and flexuous, cartilaginous, hollow, surface at first coated with pale silvery gray fibrils (similar to those on the pileus) and appearing grayish, sometimes minutely squamulose above, slowly glabrescent, becoming sordid tawny brown in age, base sparsely fibrillose to mycelioid and deeply sunken into the substratum, no sclerotium present; spores 6–7×4.5–5μ, broadly ovoid, minutely echinulate, hyaline, white in deposit, yellowish in iodine; basidia 26–28×8–9μ, four-spored; cheilocys-

tidia and pleurocystidia none; pileus-trama homogeneous, pellicle of only slightly narrower cells and not gelatinous, sordid yellowish brown in iodine; gill-trama of subparallel hyphae, pale yellowish in iodine.

Gregarious on what apparently were the very decayed remains of some fleshy fungus at Crescent Beach, Joyce, Washington, June 21, 1939 (14506-type), and June 22 (14537). It was also collected at Lake Timagami, Ontario, Sept. 4, 1936, by Dr. R. F. Cain (A.H.S. No. 4527).

The habit of the species is very similar to that of *Collybia racemosa*, but well-developed specimens, as shown in the photograph, are much larger. The colors exhibit the most peculiar changes I have ever observed in a species of *Collybia*. The above description is based on a single group of individuals in all stages of development, and there is no question but what the change is characteristic for the species. The Ontario specimens were old when collected, and the dark reddish brown colors caused me to place them tentatively near *Collybia nitellina*.

A somewhat similar species, *Collybia tylicolor*, occurs in Europe. Lange (12) recognized two species of this type, *C. tylicolor* and *Collybia erosa*, both having echinulate spores. Imler (6) apparently considers *C. erosa* sensu Lange to be an elongated form of *C. tylicolor*. The colors and color changes reported by both of these authors for this species seem to be of somewhat the same type as described for *C. olympiana*. Other differences, however, indicate that the American fungus is distinct. The latter does not have a translucent-striate, moist pileus when young. This character develops only in extreme age and fading is slow, not being at all characteristic of the manner in which hygrophanous species fade. The taste and odor are both strongly farinaceous, and the gills are apparently much closer than they are in *C. tylicolor*. I regard the thin coating of gray fibrils over the pileus and stipe of young or nearly mature individuals as a very important character, but it is one which could be missed very easily if the specimens happened to be old. Imler (6) has figured young specimens for *C. tylicolor*. Had these possessed the silvery gray fibrillose coating, he would very likely have mentioned it. The habitat of *C. olympiana* on

very decayed fleshy fungi seems significant to me, but the host or substratum in this instance is so badly decayed that reliable traces of it might not be observable in all collections.

COLLYBIA ASEMA (Fr.) Gillet.—Pileus 3–7 cm. broad, obtuse to convex when young, with an inrolled margin, becoming broadly convex, plane, or slightly umbonate, the margin sometimes turned up in age, surface glabrous and lubricous, smooth or at times slightly wrinkled or rugose, "natal brown" becoming "Saccardo's umber" or near "buffy brown" or "drab" and becoming pale isabelline (paler than Saccardo's umber), fading as if hygrophanous to "avellaneous" or pallid, margin either opaque or faintly striatulate when moist; flesh pale gray, watery, pliant, thick under the disk, but tapered abruptly and thin over the marginal area, odor and taste not distinctive; lamellae sinuate, close (55–65 reach the stipe), 3 tiers of short individuals, moderately broad (3–4.5 mm. ±), white, edges even or crenulate to slightly eroded in age; stipe 4–7 cm. long, 4–8 mm. thick at the apex, enlarged or clavate at the base, stuffed with a white pith, becoming hollow, splitting lengthwise readily, surface twisted or merely fibrillose-striate with appressed fibrils, glabrescent, faintly pruinose toward the apex, pallid to whitish above, grayish brown below, becoming reddish brown in drying; spores 6–7.5×3–4μ, narrowly ellipsoid, smooth, not amyloid; basidia four-spored; cheilocystidia and pleurocystidia not differentiated; gill-trama homogeneous, very pale yellowish in iodine; pileus-trama homogeneous, very pale yellowish in iodine, pellicle slightly gelatinous and very poorly differentiated.

Gregarious under conifers at Lake Crescent, Washington, Oct. 14, 1935 (3139); at Blue River, Oregon, Oct. 22, 1937 (8078); Belknap Springs, Oregon, Oct. 23 (8151); Crescent City, California, Oct. 29, 1937 (8202); Dexter, Michigan, in an oak woods, Sept. 23, 1938 (11076); and Joyce, Washington, July 5, 1939 (14785).

I found it to be one of the common species of *Collybia* along the Pacific coast during the spring and fall months. Kauffman, however, apparently did not collect it on his expeditions to this region. Of the species which Murrill described from the western United

States, *Collybia subrugosa* appears to be identical with *C. asema*. The rugose nature of the pileus, which Murrill emphasized, is, in my estimation, too variable a character to be used as a specific difference. Sections of Murrill's type exhibited the same characters as those given in the above description. The type specimen has a twisted striate reddish brown stipe and an ochraceous buff pileus. It appears very similar to dried specimens of my own collections.

My determination of *C. asema* is based on material collected by Lundell in Sweden and distributed in the Fungi Exsicc. Sueciae. Ricken's description also characterized my specimens very well. Lange (12) apparently believes that *Collybia butyracea* and *C. asema* are forms of one species. In my field experience the dark reddish brown or dull red *C. butyracea* seems to be distinct, and *C. asema* is likewise constant and distinct. Both fade to about the same color. As in many closely related species, intergradations can be found. Coker and Beardslee (2) point out intergradations between *C. dryophila* and *C. butyracea*. According to my experience all three are about equally distinctive one from the other and can be readily recognized when found in quantity. Single specimens are usually difficult to place.

COLLYBIA BADIIALBA Murr. (Pl. II).—Pileus (2) 3–7 cm. broad, obtuse to conic or plane with a conic umbo, the margin inrolled, becoming expanded and either plane or with an abrupt obtusely conic umbo, glabrous except for the extreme margin which is faintly downy-fibrillose at first, smooth or very finely rivulose, not translucent striate, moist to lubricous, subviscid when wet, pellicle not separable or if so only in shreds, color "carob brown" to "bay," slowly changing to "hazel" or "cinnamon-rufous" (dark reddish brown, becoming bright reddish brown), the margin finally becoming "buff pink" (pale pink), the disk remaining dark reddish, not hygrophanous; flesh thick under the disk, tapering evenly to the margin, reddish brown, soft, pliant, watery, odor none, taste mild to slightly bitterish; lamellae deeply and sharply adnexed, crowded (100–115 reach the stipe), moderately broad and nearly equal (4–5 mm.), shining white to merely whitish, in

age often becoming spotted or stained reddish brown, usually intervenose, the edges distinctly serrate to eroded; stipe 7–11 cm. long, 5–9 mm. thick (midway), hollow, slightly enlarged or abruptly narrowed at the base, not rooting, base with numerous white rhizomorphs, very rigid and strict, upper part faintly fibrillose-pruinose but soon glabrescent, longitudinally striate, color "pale pinkish buff" to "vinaceous-buff" (pale grayish flesh color), lower part becoming dark reddish brown or staining reddish brown as in *Collybia maculata;* spores globose to broadly ellipsoid, 3–4.5×3–4μ, smooth, not amyloid; basidia four-spored; cheilocystidia and pleurocystidia not differentiated; gill-trama homogeneous, yellow in iodine; pileus-trama homogeneous beneath a subgelatinous poorly differentiated pellicle, yellowish in iodine or becoming yellowish brown.

Gregarious on decayed conifer logs, Crescent City, California, Oct. 29, 1937 (8200), Oct. 30 (8259), Nov. 2, 1937 (8346); along the Hoh River, Washington, May 18, 1939 (13517); at Lake Crescent, Washington, June 2 (13950), June 4 (14048), June 9 (14245), June 21 (14517); along the Elwha River, July 4, 1939 (14765); and at Joyce, Washington, July 6, 1939 (14816).

My specimens have been compared with type material and sections of the latter have been made for microscopic examination. Since the characters of the type were found to be identical with those given in the description, they are not repeated here. The thin subgelatinous pellicle was very distinct on the type. It is not well differentiated, but is just gelatinous enough to make the pileus feel subviscid in wet weather.

Murrill does not mention reddish stains on the gills, and in my material they were not present consistently even in old specimens. Consequently, the discrepancy is best disregarded.

Of the European species, *Collybia prolixa* sensu Ricken seems to be closest, in fact is very likely identical, only Ricken (21) emphasized that the gills were "nicht geflecked." Murrill's species approaches *Collybia distorta* in that the gills are spotted at times, but that species should be readily recognized by the yellowish to pale tan gills (before becoming stained) and unpleasant taste. See Coker and Beardslee (2) for American material and Ricken (21)

for European. Rea (18) described the gills of *C. distorta* as white, becoming spotted, but his fungus grew in rings in a pine woods. Lange's (12) account of *C. distorta* closely approximates *C. badi-ialba*. Lange, apparently, believes that *C. distorta* and *C. prolixa* sensu Ricken are merely forms of one species. When the situation in regard to these two in Europe is cleared up, it will probably be necessary to reduce Murrill's species to synonymy with one of them. It would be most unfortunate if the name *distorta* should have to be applied to our western species. *C. badiialba* is one of the most symmetrical and perfectly formed Collybias I have collected.

COLLYBIA FULVIPES Murr.—Pileus 1–2.5 (5) cm. broad, convex to plane, the margin incurved at first and often remaining decurved, surface smooth, glabrous and moist, faintly striatulate, color "Sudan brown" (bright yellowish brown) on the disk, "ochraceous orange" to "zinc orange" (bright orange) near the margin, fading very slowly; flesh concolorous with the surface, pliant and tough (consistency rubbery, as in *Collybia tenuipes*), reviving when moistened, taste bitterish, odor none; lamellae close (appearing distant only in broadly expanded specimens), 24–30 reach the stipe, adnate, narrow to moderately broad, 3 tiers of short individuals, "warm buff" or more brownish (whitish only when very young), edges even; stipe 2–8 cm. long, 1–2.5 mm. thick, equal, tough, stuffed with tawny fibrils, ferruginous to blackish brown, covered over its entire length with "zinc orange" tomentum, base tawny strigose and often deeply buried in the debris, extreme apex yellowish and pruinose-pubescent; spores 5–6×1.7–2μ, cylindric or slightly curved, hyaline; basidia four-spored; cheilocystidia and pleurocystidia similar, scattered, 20–32×3–9μ, fusoid ventricose at first, soon elongating greatly and with a wavy hairlike part projecting from the hymenium, the walls sometimes thickened somewhat, hyaline; gill- and cap-trama of thick-walled flexuous hyphae (appearing glassy in KOH mounts), walls dark to pale reddish brown; basidia with blue apices in iodine, gill- and pileus-trama not changing color; stipe with projecting hyphae 2.5–4μ thick and having dark brown walls.

Scattered to gregarious, on sticks and debris, Blue River, Ore-

gon, Oct. 16, 1937 (7834); Kalaloch, Washington, April 27, 1939 (12065), April 29 (12096), and April 30 (13036); along the Queets River, Olympic Mountains, Washington, May 3 (13087); at Oil City, Washington, May 4 (13099); along the Clearwater River, Olympic Mountains, Washington, May 9 (13249); Deer Lake Trail near Sol Duc Hot Springs, Washington, May 11 (13338); Forks, Washington, May 22 (13658); Clearwater River, May 24 (13746); and Lake Angeles, Olympic Mountains, June 25, 1939 (14649).

In any natural classification this species must necessarily be arranged near *Collybia tenuipes* because of the similarity in consistency, structure of the trama of the pileus and gills, and pubescent covering of the stipe. It is distinguished from that species by its slender stature, glabrous pileus, and small cylindric spores. The latter are so small that they are nearly always difficult to locate in mounts of revived material. The gills were described as distant by Murrill, but in the type the spacing is only subdistant, and is not appreciably different from that in the collections cited above. For a detailed account of the microscopic characters of the type see Smith (30).

Hygrophorus subalpinus sp. nov.(Pl. III).—Pileus 4–6 cm. latus, convexus demum obtusus, candidus, subviscidus; lamellae decurrentes, confertae, angustae; stipes 2–4 cm. longus, 1–2 cm. crassus, bulbosus demum aequalis, siccus, annulatus, albidus; sporae 8–10×4.5–5μ. Specimen typicum legit prope Deer Park, Olympic Mountains, Washington, June 16, 1939, A. H. Smith, n. 14397, in Herb. Univ. Michigan conservatum.

Pileus 4–6 cm. broad, broadly convex when young, becoming obtuse or plane, sometimes with a slight umbo and the margin spreading or decurved, opaque, snow white over all and with a distinct luster, viscid, pellicle thin and scarcely separable from the flesh, merely subviscid in age, not discoloring appreciably, often having patches of the broken veil adhering along the margin; flesh thick (1 cm. ± near the stipe), white, soft, odor and taste perfectly mild; lamellae decurrent from the first, close (68–113 reach the stipe, many very narrow individuals extend to the stipe making the count difficult), narrow (3–4 mm.), one row of short individ-

uals, concolorous with the pileus or a duller white, edges even; stipe short, 3–4 cm. long, 1–2 cm. thick at the apex, base bulbous when young, nearly equal in age, somewhat rounded beneath the bulb, solid, white within, peronate to the apex of the bulb by a white membranous sheath which terminates in a flaring submembranous to fibrillose inferior annulus, white and silky above, annulus sometimes evanescent, no gelatinous universal veil evident; spores 8–10×4.5–5μ, ellipsoid, smooth, hyaline; basidia four-spored; cheilocystidia and pleurocystidia not differentiated; gill-trama of divergent hyphae; pileus-trama homogeneous beneath a thin gelatinous pellicle.

Gregarious under fir at about 6000 feet elevation, Deer Park, Olympic Mountains, Washington, June 16, 1939 (14397-type); and Crystal Ridge, 5000 feet elevation, June 17, 1939 (14418).

Hygrophorus ponderatus Britz. closely resembles *H. subalpinus* in color and stature, but differs in possessing a gelatinous universal veil. In the key of Smith and Hesler (33), *H. subalpinus* would have to be arranged beside *H. sordidus* Pk. It differs from Peck's species in having a dry membranous sheath and a more or less membranous annulus, as well as a thick, equal or somewhat bulbous stipe. The close, narrow, waxy gills are also distinctive. Were it not for the decidedly waxy appearance of the lamellae and the typical divergent gill-trama, *H. subalpinus* could be placed in *Armillaria* next to *Armillaria arenicola*, with which it has a superficial likeness.

Hygrophorus vernalis sp. nov. (Pl. IV).—Pileus 3–5 cm. latus, obtusus demum umbonatus, viscidus, glaber, sordide incarnato-avellaneus; lamellae decurrentes, confertae, angustae, pallidae; stipes 4–6 cm. longus, 7–9 mm. crassus, aequalis, farctus, deorsum viscidus, pallidus; sporae 11–14×6–7.5μ. Specimen typicum legit prope Deer Lake, Olympic National Park, Washington, June 13, 1939, A. H. Smith, n. 14304, in Herb. Univ. Michigan conservatum.

Pileus 3–5 cm. broad, obtuse when young and with an incurved white downy-pubescent margin, obtusely umbonate in age, surface glabrous and viscid, margin "pale vinaceous-fawn," the disk "vinaceous-buff" and with watery spots when young, in age

flushed over all with brighter pale vinaceous colors; flesh thick, concolorous with the surface or whitish vinaceous, odor and taste not distinctive; lamellae arcuate when young, long decurrent in age, close, 50–55 reach the stipe, narrow (3.5 mm. ±), whitish (paler than the margin of the pileus), edges even; stipe 4–6 cm. long, 7–9 mm. thick, equal or slightly enlarged at the base, stuffed or becoming hollow, lower part covered by a thin layer of gluten, which forms sordid yellowish patches of varnish over the basal area, appressed cottony fibrillose to the apex (not punctate above), sordid whitish or concolorous with the gills, darker in age; spores 11–14×6–7.5μ, ellipsoid, hyaline, smooth; basidia four-spored, 62–65×10–11μ, gill-trama of divergent hyphae; pileus-trama homogeneous beneath a gelatinous pellicle.

Scattered under conifers in the lower Hudsonian zone below Deer Lake, Olympic National Park, Washington, May 11, 1939 (13333), and June 13, 1939 (14304). It was found within ten to fifteen yards of melting snow banks.

The species belongs in the subgenus Limacium. In the recent study of this group by Smith and Hesler (33) it falls in the section Brunnei. Its large spores at once distinguish it from all the species treated there. *H. variicolor* Murr. is closest, but is readily distinguished by darker colors without a vinaceous tint, in addition to the smaller spores.

Hypholoma silvaticum (Pk.) comb. nov. (Pl. X, Fig. 1). *Psathyra pelliculosa* Smith, *Mycologia*, 29:58. 1937.—Peck did not include this species in his account of the New York species of *Psathyra*. Murrill (15) excluded it in his treatment of the genus, very likely on the basis of a note left by Peck stating that it was a *Tubaria*. Peck's original description is brief and rather general, and his note stating that the fungus was a *Tubaria* misled me when studying *Psathyra pelliculosa*. An examination of the type revealed that the species is not a *Tubaria*. The pileus-trama is homogeneous below a thin gelatinous pellicle, no pleurocystidia are differentiated, cheilocystidia are very abundant and similar in size and shape to those of *P. pelliculosa*. The basidia are four-spored, and the spores measure 7–9 (10)×4.5–5.5μ. They are pale brown

in KOH (as are spores of many purple-brown-spored agarics). They have an apical hyaline germ pore, thickened walls, and are narrowly ellipsoid. The spores of *P. pelliculosa* are a true purple-brown when fresh, but become pale brown after being dried and remoistened in KOH. Peck did not have a clear concept of this species as is evidenced by the fact that his description of *Hypholoma fragile* covers a collection of *P. silvatica* and one of *H. hymenocephalum* (see *H. fragile* in this report). It is, thus, not surprising that he was unable to give a clear account of *P. silvatica* and that it later acquired another name. After one has studied and dried fresh material and restudied the dried specimens, additional collections, seen only in the dried condition, can be accurately determined. It is this sequence which enabled me to establish that Peck's species is not a *Tubaria* and is the one I had named *P. pelliculosa*. Because of its resemblance to *Hypholoma dispersum*, it should be arranged beside the latter in that genus.

Hypholoma tsugicola Kauffman (Pl. IX).—I have not collected this species, but as a result of a study of Kauffman's specimens, notes, and photographs it was discovered that the illustration (8, Pl. 8), is not of the species Kauffman described on page 133. Kauffman collected two new Hypholomas on the west slope of Mount Hood. One was the species he described under the name *H. tsugicola*, and the other, the one illustrated by Plate 8, is the species Parker (16) later described as *Hypholoma maculatum* from Atkinson's Mount Rainier collections. Kauffman had photographs of both, and these were interchanged because of some situation which cannot now be explained. Plate IX in this report is from his photograph of the type of *H. tsugicola*. Parker lists *H. maculatum* as known only from Mount Rainier National Park. Kauffman's Mount Hood record extends the distribution south into Oregon. Parker also lists the type locality of *H. tsugicola* as Hood River, Oregon. As far as I can determine, this is an error. Kauffman's label and notes give the location simply as Mount Hood. There is no information indicating that Kauffman ever collected at Hood River.

Mycena alnicola sp. nov. (Pl. V, Fig. 2; Pl. XXV, Figs. 1–3). —Pileus 1–2.5 cm. latus, obtuse conicus vel campanulatus, griseocaeruleus, hygrophanus, demum griseus, striatus; lamellae adnatae subdistantes, angustae, pallide griseae; stipes 4–6 cm. longus, 1.5–2 mm. crassus, fragilis, aequalis, glaber, griseocaeruleus demum pallidus; sporae (6) 7–9 (10)×4–5μ; basidia tetraspora; pleurocystidia et cheilocystidia similia, 26–40×9–13μ, clavata, vel fusoide ventricosa saepe irregularis. Specimen typicum legit prope Elwha River Ranger Station, Olympic Mountains, Washington, June 23, 1939, A. H. Smith, n. 14559, in Herb. Univ. Michigan conservatum.

Pileus 1–2.5 cm. broad, ellipsoid at first, soon becoming obtusely conic, finally broadly campanulate or convex, the margin appressed at first, surface glaucous from a dense bloom giving the cap a bluish sheen, soon polished and moist, color "benzo brown" to "fuscous" on the disk, the remainder "light drab" or the extreme margin whitish, becoming "drab-gray" or paler in age, hygrophanous but scarcely changing color when moisture escapes, when mature and moist translucent striate, becoming sulcate striate; flesh thin and fragile, gray, odor and taste mild; lamellae ascending adnate, usually not toothed, subdistant (20–30 reach the stipe), 2 tiers of short individuals, narrow to moderately broad (2 mm. ±), equal, color "pale gull gray," intervenose, edges even; stipe 4–6 cm. long, 1.5–2 mm. thick, fragile, equal, hollow, base somewhat strigose, the upper part at first covered by a dense white bloom, soon polished and moist, "dark quaker drab" to "dark mouse gray" (with a distinctly bluish gray cast) at first, concolorous with the pileus at maturity; spores (6) 7–9 (10)×4–5μ, amyloid, ellipsoid, smooth; basidia four-spored; cheilocystidia 26–40×9–13μ, clavate to broadly fusoid, becoming elongated, subcylindric or fusoid ventricose, sometimes with one or two finger-like protuberances, the apices smooth or with a slight resinous incrustation when revived in KOH; pleurocystidia similar to cheilocystidia, rare to scattered; gill-trama of inflated cells, homogeneous, pileus-trama with a thin pellicle, strongly differentiated hypodermis, and narrow region of floccose tissue, pale

vinaceous brown in iodine; tissue of the stipe and gills also pale vinaceous brown in iodine.

Cespitose to scattered on alder logs, Olympic Mountains, Washington. Specimens in addition to the type were collected along the Clearwater River, May 9, 1939 (13237).

Both pileus and stipe of young specimens vary considerably in color, but always have a strong shade of bluish gray beneath the hoary bloom. In age the entire fruiting body becomes glaucous gray. As a rule the colors of the fragile gray Mycenas are scarcely distinctive, but in this species the bluish tint is more pronounced than usual. The fungus is intermediate between *Mycena parabolica* sensu Kauffman and *Mycena griseiconica* Kauffman. *Mycena atrocyanea* (*M. nigricans* Bres.) is darker in color and does not grow in clusters on decaying logs.

Mycena hudsoniana sp. nov. (Pls. VI and XXV, 4 and 5).—Pileus 2–5 cm. latus, obtuse conicus demum subexplanatus, glaber, fuscus demum griseus, striatus, fragilis; lamellae adnatae, confertae, angustae, pallide griseae; stipes 3–5 cm. longus, 1.5–3 mm. crassus, fragilis, aequalis, cavus, glaber, fuscus demum griseus; sporeae 8–11 (12)×5–6μ; cheilocystidia et pleurocystidia similia, clavata vel capitata, echinulata. Specimen typicum legit prope Deer Lake, Olympic National Park, June 24, 1939, A. H. Smith, n. 14613, in Herb. Univ. Michigan conservatum.

Pileus 2–5 cm. broad, obtusely conic, becoming somewhat expanded, usually broadly umbonate, margin appressed against the stipe when young, glabrous and polished, moist, "fuscous" on the disk, "drab" toward the whitish margin (blackish on the disk at first, dark gray toward the margin), hygrophanous and fading to "pale smoke gray," closely striate when moist, somewhat sulcate in age or when faded; flesh thin, firm but fragile, concolorous with the surface, odor mild or faintly fragrant, taste not distinctive or slightly subnauseous; lamellae ascending adnate or with a decurrent tooth (hooked), close to crowded (25–30 reach the stipe), narrow (scarcely 2 mm. broad), color "pale smoke gray," edges even and pallid; stipe 3–5 cm. long, 1.5–3 mm. thick, equal, hollow, very fragile, with a faint hoary bloom at first, soon becoming

polished and watery, concolorous with the pileus or slightly paler above; spores 8–11 (12)×(4) 5–6μ, amyloid, narrowly ellipsoid or pip-shaped; basidia four-spored or occasionally two-spored; cheilocystidia and pleurocystidia similar and fairly abundant, capitate to abruptly clavate, the enlarged part very finely echinulate, hyaline, 32–50×15–40μ, gill-trama sordid vinaceous brown in iodine; pileus-trama with a thin pellicle, a strongly differentiated hypodermis and a moderately broad region of floccose tissue, vinaceous brown in iodine.

Gregarious on needle beds under conifers in the Hudsonian zone, Olympic National Park, Washington. It is known from the type locality and also from an elevation of 4500 feet on the trail to Boulder Lake, also in the Park (13827).

The spore size of *M. hudsoniana* seems to be somewhat variable. In deposits spores usually measured 9–12×5–6μ, although in one pileus from the type collection the measurements were 7–10×4–5μ. In mounts from dried specimens the spores usually measure 7–10×5–6μ. Occasional two-spored basidia were found in nearly all of the fruiting bodies examined, but were not frequent enough to account for the variability in spore size. Since their sterigmata were similar to those on four-spored basidia, it was impossible to be certain that such basidia were producing spores of a different size.

From the evidence at hand the species appears to be one of the typically vernal members of the genus. All of the collections were found within short distances of melting snow banks.

M. hudsoniana is very closely related to *M. subplicosa* Karst. It can be readily distinguished by its more fragile stipe which splits readily longitudinally into several segments, by its much larger size, lack of ochraceous tints on the margin of the pileus in age, slightly larger spores, and by the habitat.

Mycena insignis sp. nov. (Pl. V, Fig. 1, and Pl. XXV, Figs. 6 and 7).—Pileus 5–10 mm. latus, convexus, late convexus vel explanatus, subviscidus, nitens, demum siccus et obscurus, subsulcatus, sordide lacteus; lamellae adnatae demum subdecurrentes, confertae vel subdistantes, lactae; stipes 2–3 cm. longus, 1 mm. crassus, aequa-

lis, viscidus, glaber, sordide lacteus; sporae 6–7.5×3μ; cheilocystidia 30–37×6–10μ. Specimen typicum legit prope Olympic Hot Springs, Olympic National Park, Washington, June 5, 1939, A. H. Smith, n. 14071, in Herb. Univ. Michigan conservatum.

Pileus 5–10 mm. broad, when young convex or flattened somewhat on the disk, becoming broadly convex or plane in age, margin appressed against the stipe when young, flaring slightly at maturity and sometimes wavy in age, surface subviscid to viscid and shining when wet, soon dry and dull or very faintly pruinose under a lens, with a very thin but tenacious separable pellicle, faintly translucent striate to the disk, color more or less dull or sordid milk white or disk "cartridge buff" to "tilleul buff," sordid whitish over all in age; flesh thin, moderately fragile, pallid, odor and taste not recorded; lamellae bluntly adnate when young, soon with a short or long decurrent tooth, close to subdistant (12–14 reach the stipe), narrow but broadest at point of attachment (1.5–2 mm. ±), whitish, edges even and pallid; stipe 2–3 cm. long, 1 mm. ± thick, equal, cartilaginous and pliant, shining and viscid when wet, soon dry and dull, base sparsely white strigose, glabrous above, color dull watery grayish white below, dull white above; spores narrowly ellipsoid, 6–7.5×3μ, amyloid; basidia four-spored, 20–22×5–6μ; cheilocystidia very abundant, 30–37×6–10μ, clavate to fusoid, often forked, the apices evenly tapered to sharp points, often with occasional short projections arising anywhere from near the base to the apex in an irregular manner, hyaline; pleurocystidia none; gill-trama of floccose tissue, subhymenium not gelatinous, gill-edges not gelatinous, tramal body pale vinaceous brown in iodine; pileus-trama with a well-differentiated hypodermis beneath a thin nongelatinous pellicle, the remainder (one-half ±) floccose, all but the pellicle pale vinaceous brown in iodine, the pellicle made up of very slender threads which give off short branches the tips of which gelatinize somewhat and cause the wet surface to feel sticky.

Gregarious in troops of fifty to several hundred individuals on beds of fir needles during June in the lower Hudsonian and upper Canadian zones. In addition to the type, specimens were found in the Sol Duc River Valley near Sol Duc Park (in the Olympic National Park), June 20, 1939 (14471).

This is one of the most peculiar species of *Mycena* I have encountered. It is readily recognized in the field by the whitish color assumed by the conifer needles in the area on which the fruiting bodies will be produced. In addition to this the fruiting bodies themselves have very unusual characters. The cheilocystidia are peculiar, and the pellicle of the pileus is most deceiving. One studying only the dried material would never suspect the species of having either a separable or a viscid pellicle, since the latter does not gelatinize in the usual manner when mounted in KOH. When collected under dry atmospheric conditions the viscidity of both pileus and stipe might not be noticeable. When collected during wet weather, however, both are distinctly gelatinous to the touch and, in fact, remind one of wet specimens of *M. epipterygia*. The gelatinous character of the stipe is caused by a thin coating of long slender (2μ thick) hyphae with subgelatinous walls. These hyphae grow out at right angles to the length of the stipe and then become appressed to it. No well-organized gelatinous layer similar to that usually found in species of the Glutinipedes is present in *M. insignis*. The viscidity of the pileus is caused by similar but shorter hyphal branches than those which occur on the stipe.

The relationship of *M. insignis* is by no means clear. In stature and general appearance it reminds one of short-stiped forms of *M. viscosa*, and its cheilocystidia are similar to those found in certain forms related to *M. viscosa*. In its other characters, however, it departs sharply from the above group and should be placed in a subsection by itself.

Omphalia hohensis sp. nov. (Pl. VIII, Fig. 1).—Pileus 5–10 mm. latus, convexus vel depressus, demum subinfundibuliformis, glaber, fuscus, valde striatus, hygrophanus, demum sordide cinereobrunneus; lamellae distantes, adnato-decurrentes, latae, pallide fuscae; stipes 1–2.5 cm. longus, 1 mm. crassus, aequalis, fragilis, sordide fuscus, farctus; sporae 7–9×4–5μ. Specimen typicum legit prope Jackson Guard Station, Olympic National Park, Washington, May 19, 1939, A. H. Smith, n. 13555, in Herb. Univ. Michigan conservatum.

Pileus 5–10 mm. broad, convex with a slightly depressed disk, margin appressed against the stipe at first, in age broadly convex to

plane and the disk sharply and deeply depressed, surface glabrous or very slightly fibrillose in the depression, when faded appearing silky under a lens, when moist "bister" on the margin and "mummy brown" on the disk, broadly and distantly translucent striate, when faded "drab" over all, hygrophanous; flesh very thin, concolorous with the surface, pliant to fragile, odor and taste mild or the odor very faintly fragrant; lamellae distant (10–13 reach the stipe), broadly adnate becoming long decurrent, triangular, 3 mm. broad in the broadest part, very pale drab, paler than the faded pileus, edges even; stipe 1–2.5 cm. long, 1 mm. thick or less, equal, watery and fragile, concolorous with the pileus in moist and faded condition, stuffed solid, pith grayish, glabrous or very faintly pruinose under a lens; spores 7–9×4–5μ, ellipsoid, yellowish in iodine; basidia four-spored; cystidia not differentiated on either the sides or edges of the lamellae; pileus and gill-trama homogeneous.

Singly on wet sand in an overflow area, Hoh River, Washington, near the Jackson Guard Station in the Olympic National Park, May 19, 1939 (13555).

In Lange's Icones (12) *Omphalia rustica* is close to the above species, but differs in having the margin of the pileus incurved at first and in the more or less equal, not triangular, gills. Kauffman's collections of *O. rustica* from Oregon have a larger, more cartilaginous fruiting body with the gills as Lange illustrated them. My specimens from the Hoh River had the stature and consistency of *Omphalia ignobilis* Josserand. The margin of the pileus is straight in very young specimens, but as the pileus expands it becomes bent down slightly between the gills. *Omphalia serotina* Peck is apparently close, but is larger and has white gills. *Omphalia griseopallida* is also close to *O. hohensis* but is described with larger spores on four-spored basidia, see Imler (6). *Omphalia fuscella* Quél. is said to have white gills.

Omphalia occidentalis sp. nov.—Pileus 4–8 mm. latus, convexus vel conicus, glaber, nitens, sinuatus, luteus vel luteofulvus, hygrophanus, demum pallide luteus; lamellae decurrentes, distantes, latae, luteofulvae; stipes 1–1.5 cm. longus, 1 mm. crassus,

aequalis, glaber, laete luteus, deorsum pallidus; sporae 7–9×4–5μ. Specimen typicum legit prope Heart O'Hills, Mount Angeles, Olympic Mountains, Washington, June 25, 1939, A. H. Smith, n. 14623, in Herb. Univ. Michigan conservatum.

Pileus 4–8 mm. broad, convex to obtusely conic, margin appressed against the stipe at first, surface glabrous, moist and glistening, margin opaque when moist and soon becoming crenate or irregularly lobed with the sinuses often rounded, color "wax yellow" on the disk and "amber yellow" near the margin when moist, hygrophanous and fading to near "ivory yellow" over all; flesh thin and fragile, yellowish, odor and taste mild; lamellae long decurrent, extending unequal distances down the stipe, distant (7–8 reach the stipe), one tier of short individuals, broad (2.5 mm.) in the broadest part, triangular in outline, "amber yellow," edges even; stipe 1–1.5 cm. long, 1 mm. ± thick, equal or narrowed below, solid or with a very fine tubule, glabrous and translucent, "barium yellow" above, whitish below, inserted on moss and soil, no fibrils visible; spores 7–9×4–5μ, ellipsoid, hyaline, smooth, not amyloid; basidia 22–24×7–8μ, four-spored; cheilocystidia and pleurocystidia not differentiated; pileus-trama homogeneous beneath a thin subgelatinous pellicle of narrow yellow hyphae; gill- and pileus-trama yellowish in iodine.

Scattered on moss and soil at an elevation of 3000 feet, near Heart O'Hills, Mount Angeles, Olympic Mountains, Washington, June 25, 1939 (14623).

Some spores, 9–14×5μ, were also found on four-spored basidia, but the typical range is that given in the description. The bright yellow color is distinctive. The pileus is very likely somewhat viscid at times because of the subgelatinous pellicle, but the character is difficult to determine in such a small fungus. The glistening appearance is that of a wet surface and not of the micaceous type observed on species with a cellular surface layer over the pileus, such as is found in species of *Psathyrella* or *Conocybe*.

The relationships of *O. occidentalis* are difficult to ascertain. In some respects it is similar to those small white species of *Omphalia* that Kühner (9) has transferred to the genus *Mycena*. In other respects it resembles a small *Hygrophorus*. *Omphalia Kewensis*, to

judge from the description, is similar, but it is extremely unlikely that the two are the same. The English species was found in a greenhouse on the dead rhizome of a filmy fern.

OMPHALIA VIRIDIS (Fl. Dan.) Lange (Pl. VIII, Fig. 2).—Pileus 10–25 mm. broad, when very young with a flattened or slightly depressed disk and an incurved margin, becoming obtuse, plane or with an abrupt deep and broad depression in the center, margin usually spreading and undulate, surface glabrous and either smooth or somewhat wrinkled, moist, when young "dusky green-gray" or "plumbeous-black" (with a bluish black cast), hygrophanous, fading to "castor gray," "olivaceous black (2)," or "andover green," and finally becoming "tilleul buff," not striate at first but becoming so as the colors fade, pale specimens usually with broad translucent striations near the margin; flesh thin, soft and watery, concolorous with the surface, taste mild, odor earthy or slightly fishy; lamellae long and unevenly decurrent, subdistant (15–20 reach the stipe), many forked near the outer extremity, 2 tiers of short individuals, broad (3–4 mm.), nearly always intervenose, color "mineral gray" to "light olive-gray" (with bluish gray to a greenish gray cast); stipe 2–3 cm. long, 2–3 mm. thick, glabrous, fragile, solid or hollowed near the gills, concolorous with the pileus or more blackish, remaining dark, moist, base fibrous and debris readily adhering to it; spores ellipsoid, hyaline, smooth, 7–9×4.5–5μ, not amyloid; basidia four-spored, cheilocystidia and pleurocystidia not differentiated; pileus-trama homogeneous, the dark color in the cell sap.

Scattered to gregarious on muck soil in a burned area along with a moss, *Funaria hygrometrica*, Kalaloch, Washington, April 23, 1939 (12050), April 29 (12090), May 5 (13166).

Rea (20) has retained this fungus as a variety of *Omphalia umbellifera*. It is apparently very widely distributed, but rarely collected. *O. umbellifera* is one of the very common agarics along our Pacific coast and is very constant in its color and markings. The colors of *O. viridis* are a bluish black-green at first, changing to dull olive green, and finally fading to sordid whitish. As in pink-spored agarics, color in *Omphalia* is a rather important diagnostic

character, and when it is as strikingly different as in *O. viridis* and *O. umbellifera*, it may justifiably be used as a specific difference. When specimens are properly dried the green color is well preserved.

Psathyrella carbonicola sp. nov. (Pls. XI and XXIX, Figs. 4 and 6).—Pileus (1.5) 3–6 cm. latus, conicus demum convexus, fibrillosus demum glaber, levis vel rugulosus, spadiceus demum pallide brunneus, hygrophanus; lamellae confertae, adnatae, angustae, pallide brunneae; stipes 3–7.5 cm. longus, 2–5 mm. crassus aequalis, fragilis, fibrillosus, albidus demum sordide brunneus; sporae 6–7.5×3–3.5μ; cheilocystidia et pleurocystidia similia, 34–45 (50)×9–12μ, ventricosa, apice acuta. Specimen typicum legit prope Booth, Oregon, Nov. 24, 1935, A. H. Smith, n. 3615, in Herb. Univ. Michigan conservatum.

Pileus (1.5) 3–6 cm. broad, obtusely conic to convex at first, in age broadly convex to plane, surface at first covered by superficial white fibrillose scales, margin appendiculate with white fibrillose patches of veil tissue, the scales appressed or somewhat recurved, glabrescent, surface smooth or rugulose, color "chocolate" to "bister" when fresh, becoming nearly "wood brown" and striatulate before fading, hygrophanous, sordid cinnamon buff or near avellaneous when faded; flesh thin or thick (up to 3 mm. at times), tapering gradually toward the margin, very fragile, watery brown, odor faintly disagreeable, taste mild; lamellae close to crowded, adnate, narrow, pallid brownish, bister in age, edges whitish but even; stipe 3–7 cm. long, 2–5 mm. thick, equal, tubular, cartilaginous, fragile, surface fibrillose to scaly up to the evanescent annular zone, more or less glabrescent in age, white, becoming pallid brownish; spores 6–7.5×3–3.5μ, dark fuscous under the microscope, with a very minute apical germ pore (visible only under oil immersion and then only obscurely); basidia four-spored; cheilocystidia and pleurocystidia similar, abundant, 34–43 (50)×9–12μ, hyaline, ventricose above a short pedicel, with tapered necks and pointed apices; gill-trama homogeneous; pileus-trama homogeneous beneath a surface layer of hyaline vesiculose cells.

Cespitose to gregarious on burned ground, Booth, Oregon, Nov.

24, 1935 (3615). This is a common species on burned ground along the Pacific coast in California, Oregon, and Washington. The description was taken from the specimens cited above.

At first I considered this to be merely a large form of *Psathyrella pennata*. A close study, however, revealed several important differences. Most important is the spore size. The spores of *P. carbonicola* seldom measure 8μ long and 4μ broad, whereas European authors are quite consistent in giving the spore size as 8–9 (10) $\times$4–5μ. The sharp pointed cystidia of *P. carbonicola* are also distinctive. Most European writers report *P. pennata* from burned areas, but Lange (13) has recently reported it merely from wet soil. Kauffman, in certain of his Mount Hood collections not reported in his paper (8), had one consisting of a single specimen and notes of a fungus apparently identical with Lange's *P. pennata*. Drawings of its spores and cystidia are given in Plate XXXI, Figs. 9 and 10, for a comparison with those of *P. carbonicola*. My report (26) of *Psathyra pennata* from Michigan is based on small specimens of *P. carbonicola*.

Psathyrella cuspidata sp. nov. (Pl. XXIX, Fig. 10, and Pl. XXX, Fig. 2).—Pileus 1.5–3 cm. latus, 3–4.5 cm. altus, conicus vel cuspidatus, fibrillosus demum glaber, pallide fulvus demum lividus, hygrophanus, demum pallidus, fragilissimus; lamellae confertae vel subdistantes, angustae, latae, adnatae, pallidae demum fulvae; stipes 4–8 cm. longus, 4–8 mm. crassus, aequalis, fragilissimus, fibrillosus, albus; sporae 9–11 (12)$\times$5–6μ; pleurocystidia et cheilocystidia 60–80$\times$12–20μ. Specimen typicum legit prope Sol Duc Hot Springs, Olympic Mountains, Washington, June 24, 1939, A. H. Smith, n. 14610, in Herb. Univ. Michigan conservatum.

Pileus 1.5–3 cm. broad, up to 4.5 cm. high, prominently conic to cuspidate, becoming narrowly conic-campanulate or remaining conic, margin appressed against the stipe when young, flaring somewhat in age, covered by a dense appressed coating of white fibrils at first, glabrescent (around the disk first), margin remaining appendiculate from white fibrillose patches, moist, "pinkish buff" when very young, becoming "ochraceous-tawny" to "tawny"

(pale rusty brown) as the pileus enlarges, at maturity the marginal area changing to "light drab" or "drab" (livid) as the spores mature, the umbo becoming "chamois" (pale yellowish), hygrophanous, fading to "tilleul buff" (pallid) or slightly darker over all except the umbo, which remains yellowish; flesh very rigid and very brittle, thin, concolorous with the surface, odor none, taste mild; lamellae close to crowded (subdistant in age), 20–25 reach the stipe, narrow, 2.5 mm. broad, equal, ascending adnate, whitish when young (paler than "tilleul buff"), "russet" to "Mars brown" (dark rusty brown) when mature, edges even; stipe 4–8 cm. long, 4–8 mm. thick, equal or slightly narrowed toward the apex, hollow, very fragile, when young coated with a thin layer of snow-white fibrils, glabrescent and whitish below, surface often transversely undulate, in age white fibrillose scurfy above; spores 9–11 (12)×5–6μ, ellipsoid, russet under the microscope (in water mounts), with an apical hyaline germ pore; basidia four-spored; pleurocystidia and cheilocystidia similar and abundant, fusoid ventricose, the neck long but the apex obtuse, 60–80×12–20μ; gill-trama tinged pale cinnamon from the slightly colored cell sap of the hyphal cells, subhymenium darker, central part of vesiculose cells; pileus-trama with a surface layer of vesiculose cells about three cells deep, the remaining trama floccose and colored slightly—similar to that of the gills.

Densely cespitose in large masses on alder logs, Sol Duc Hot Springs, Olympic Mountains, Washington, June 24, 1939 (14610). Although found but once, all stages of development were present, from the smallest buttons to old decaying pilei.

This is one of the most distinctive and brittle species of *Psathyrella* I have encountered. The narrowly conic pale tawny pilei, the rather well-developed veil, and the large cystidia are all distinctive. It approaches *Psathyrella hydrophila* in its cespitose manner of growth. The large spores at once distinguish it from *Hypholoma confertissimum* Atk. and related cespitose species.[2] *Psathyra multissima* Imai closely resembles *P. cuspidata* in habit

[2] The group consists of **Psathyrella confertissima** (Atk.) comb. nov., **Psathyrella microsperma** (Pk.) comb. nov., and **Psathyrella multipedata** (Pk.) comb. nov. For a discussion of these species see Smith (32).

and stature, but *cuspidata* differs in its larger spores and abundant pleurocystidia. Although the fruiting bodies developed in large masses, they were so brittle that in carrying them by automobile for the short distance of fifteen miles they were rendered unfit for photographing.

Psathyrella luteovelata sp. nov. (Pl. X, Fig. 2, and Pl. XXIX, Figs. 7 and 8).—Pileus 2–4 cm. latus, obtuse conicus demum campanulatus, luteofibrillosus demum glaber, pallide fulvus, hygrophanus, demum ochroleucus; lamellae adnatae, confertae, latae, pallide brunneae demum lividae; stipes 4–5 cm. longus, 2.5–3.5 mm. crassus, aequalis, fragilis, albidus vel pallidus, luteofibrillosus demum glaber; sporae 7–8×3.5–4μ; cheilocystidia et pleurocystidia 38–56×10–14μ, fusoide ventricosa. Specimen typicum legit prope Elwha River Ranger Station, Olympic National Forest, Washington, June 8, 1939, A. H. Smith, n. 14184, in Herb. Univ. Michigan conservatum.

Pileus 2–4 cm. broad, obtusely conic when young, becoming broadly campanulate in age, margin appressed against the stipe at first, surface at first covered by delicate "ivory yellow" or brighter fibrils and the margin fibrillose appendiculate from the remains of the yellow veil, moist, "sayal brown" to "cinnamon brown" (pale rusty to dark rusty brown) beneath the fibrils, hygrophanous, fading to near "wood brown" on the margin and "light ochraceous buff" on the disk with watery streaks while fading; flesh very soft and fragile, concolorous, odor and taste not distinctive; lamellae bluntly adnate but soon seceding, close, 27–30 reach the stipe, broad (3.5 mm.), broadest at base and tapered to the margin, pallid brownish at first, "light drab" at maturity, edges minutely fimbriate; stipe 4–5 cm. long, 2.5–3.5 mm. thick, equal, fragile, hollow, whitish, at first covered by "ivory yellow" veil flecks or zones, glabrescent; spores 7–8×3.5–4μ, narrowly ellipsoid, with an indistinct apical germ pore; basidia four-spored; cheilocystidia and pleurocystidia similar, scattered, 38–56×10–14μ, apices blunt, narrowly fusoid venticose; pileus-trama with a layer of vesiculose cells over the surface, tissue beneath homogeneous, the hyphae having rusty brown walls, gill-trama also of brown-walled cells.

Singly to gregarious on soil, Hoh River, at the Jackson Guard Station in the Olympic National Park, June 6, 1939 (14115), and along the Elwha River near the Elwha River Ranger Station, Olympic National Forest, June 8, 1939 (14184-type), June 6 (14248), and June 23 (14589).

The margin of the pileus is appressed against the stipe in young specimens. It is very close to *Psathyrella chondroderma*, but differs in its narrower spores and pale but clear yellow universal veil as well as by the white stipe, which does not become discolored in age.

Psathyrella michiganensis sp. nov. (Pl. XIII, Fig. 2, and Pl. XXIX, Figs. 1–3).—Pileus 1–2.5 cm. latus, obtuse conicus, pubescens demum glaber, sordide brunneus demum brunneoater, hygrophanus, demum atomatus; lamellae adnatae, confertae, latae, avellaneae demum fuscobrunneae; stipes 2–5 cm. longus, 1–1.5 mm. crassus, aequalis, strictus, pubescens demum subglaber, sursum pallidus, deorsum sordidus; sporae 8–10×5–6μ, fuscae; cheilocystidia ventricosa, apice capitata. Specimen typicum legit prope Milford, Michigan, Sept. 15, 1938, A. H. Smith, n. 10920, in Herb. Univ. Michigan conservatum.

Pileus 1–2.5 cm. broad, obtusely conic and with the margin appressed against the stipe when young, remaining broadly conic or in age the margin flaring somewhat, surface moist, when young minutely pubescent from projecting hairs, soon glabrescent, opaque when young and moist, only very faintly striate at maturity, color varying from sordid "tawny-olive" to "bister" or nearly black when the spores mature, sometimes the disk becomes "wood brown" and the margin "avellaneous," hygrophanous, atomate when faded, fading to sordid ashy brownish gray or grayish white, margin regular and not striate or folded in age; flesh very thin and fragile, odor none, taste very faintly of radish; lamellae ascending adnate, not readily seceding, moderately close (23–27 reach the stipe), moderately broad, color pale avellaneous when young, slowly becoming fuscous brown, edges even; stipe 2–5 cm. long, 1–1.5 mm. thick, equal, erect, strict and rigid, tubular, densely white pubescent (under a lens) at first, soon glabrous or with scattered fibrillose flecks, whitish above, base sordid brown, in age yellowish or sordid brown over all except the apex, base tinged

reddish at times, occasionally longitudinally striate over the lower half; spores 8–10×5–6μ, ellipsoid, with a hyaline apical germ pore, very dull fuscous brown under the microscope when fresh, blackish in KOH; basidia four-spored; cheilocystidia 18–23×10–14μ, with a ventricose mid-part, an abrupt narrow neck terminated by a head 3–4μ thick, neck less than 2μ thick, hyaline (they are similar in shape to those found on many species of *Conocybe*); pleurocystidia none; pileus-trama corticated by a palisade of pear-shaped cells (as in *Conocybe*) measuring 18–50×10–30μ long, slender hyaline hyphae with thin walls project from between the cells of this layer causing the finely pubescent appearance of the young pileus, the remainder of the trama of irregularly interwoven enlarged cells.

Gregarious in an old woods road on sawdust, Milford, Michigan, July 8 and Sept. 15, 1939 (9587 and 10920).

This is a curious species because it possesses all of the distinguishing characters of the genus *Conocybe* with the exception of the dull fuscous-black spores. In the outline of a classification proposed by Romagnesi (22), *P. michiganensis* would be placed in a section by itself.

Psathyrella olympiana sp. nov. (Pls. XII, XXIX, Figs. 5 and 9, and Pl. XXX, Fig. 1).—Pileus 1–4 cm. latus, obtuse conicus vel convexus, demum subplanus vel umbonatus, glaber, striatulatus, rufoferruginus, hygrophanus, demum sordide subochraceus; lamellae adnatae, confertae, latae, pallide brunneae demum lividae; stipes 3–5 cm. longus, 2–5 mm. crassus, aequalis, fragilis, albidus, deorsum fibrillosus; sporae 7–9 (10)×4–5μ; cheilocystidia et pleurocystidia 38–65×9–14μ. Specimen typicum legit prope Jackson Guard Station, Olympic National Park, Washington, June 6, 1939, A. H. Smith, n. 14118, in Herb. Univ. Michigan conservatum.

Pileus 1–4 cm. broad, obtusely conic to convex, becoming nearly plane or remaining unexpanded, at times slightly umbonate, margin appressed against the stipe when young, glabrous or the margin with scattered remains of the rudimentary veil, striatulate when moist, "Mars brown" to "cinnamon brown"

(dark rusty brown), hygrophanous and fading to sordid "pinkish buff" or dull dirty tan color, the surface even or slightly rugulose when faded; flesh thin to moderately thick, dark brown when moist, pallid when faded, fragile, odor and taste not distinctive; lamellae bluntly adnate, soon seceding, close (29–35 reach the stipe), broad (3 mm. ±), pallid brownish when young, "drab" at maturity, edges whitish; stipe 3–5 cm. long, 2–5 mm. thick, equal, hollow, fragile, white, densely white fibrillose over the lower part, upper part fibrillose-squamulose to coarsely pruinose and faintly striate; spores 7–9(10)×4–5μ, bright reddish brown under the microscope in water mounts of fresh material, dark fuscous brown in KOH, tinged reddish brown in fresh deposits, narrowly ellipsoid to subcylindric or slightly bean-shaped in one view, with an apical hyaline germ pore; basidia four-spored, 17–20×8–9μ; cheilocystidia and pleurocystidia similar, very abundant, 38–65×9–14μ, fusoid ventricose to subcylindric above a narrowed pedicel, the walls usually slightly thickened—especially toward the apex, with or without a slightly encrusted apex, hyaline in water mounts of fresh material, dull vinaceous brown in sections revived in KOH; gill-trama of reddish brown hyphae; pileus-trama with a layer of vesiculose cells over the surface (60μ thick ±), the tramal body homogeneous and of reddish brown hyphae in water mounts of fresh material.

Scattered to gregarious on old wood and debris of alder and cottonwood, Lake Quinault, Washington, May 17, 1939 (13454); Graves Creek Inn, May 23 (13707); Clearwater River, May 24 (13744); Jackson Guard Station, Olympic National Park, June 6, 1939 (14118-type).

The relationships of this species are interesting. Because of its cystidia it might be considered closely related to *Psilocybe sarcocephala*, *Psilocybe camptopoda*, *Psilocybe connisans*, *Psilocybe spadicea*, or *Psilocybe polycephala* (if the latter be recognized as a species). The distinct though scanty veil and appressed margin of the pileus in button stages are not characters of these species. In addition, the reddish color of the spores is not as pronounced as in the above group. The thick-walled cystidia with their colored content in KOH distinguish it from any other *Psathyrella* which I

have studied. Macroscopically, one would most likely confuse it with *Psathyrella hydrophila*, from which it is readily distinguished by both its spores and cystidia.

Psathyrella atrifolia (Pk.) comb. nov. (Pls. XIV, XV, and XXVI, Figs. 1, 2, and 9). *Hypholoma atrifolium* Pk., *Bull. Torrey Bot. Club*, 23: 417. 1896.—Pileus 2–6 cm. broad, obtusely conic to convex when young, at maturity either with a low obtuse umbo or plane, sometimes remaining broadly convex, the margin frequently wavy in age, surface glabrous except for evanescent white fibrillose patches or fringes of veil remnants along the margin, moist and at times lubricous, "buckthorn brown" at first, becoming "cinnamon brown" and finally tinged "wood brown" as the spores mature, usually only faintly striatulate, hygrophanous, fading to "cinnamon buff" or "pinkish buff" over the disk, the remainder "tilleul buff" to pale "avellaneous," radially rugulose when faded; flesh very thin but moderately firm, fragile, concolorous with the surface, odor and taste mild, lamellae horizontally adnate and often developing a distinct tooth, close to subdistant (26–30 reach the stipe), broad (5–8 mm.), equal, 3 tiers of shorter individuals, "tilleul buff" when young, "drab" to "benzo brown" at maturity, becoming blackish in age, edges even or minutely crenulate; stipe hollow, not noticeably fragile, white, becoming only slightly discolored, pallid in age, more or less white fibrillose up to the superior fibrillose annular zone, glabrescent over all, apex pruinose, base surrounded by white cottony mycelium; spores 7–9 (10)×4.5–6μ, broadly ellipsoid, reddish brown under the microscope when fresh, when revived in KOH very dull fuscous brown, with a distinct hyaline apical germ pore, apiculus very inconspicuous; basidia four-spored, 18–20×7–8μ; cheilocystidia numerous, 32–46×10–15μ, saccate to broadly fusoid ventricose, hyaline; pleurocystidia scattered to abundant, 38–50×10–18μ, ventricose with short necks and obtuse apices; gill-trama homogeneous; pileus-trama homogeneous beneath a surface layer of hyaline vesiculose thin-walled cells, the cells not arranged in a palisade layer.

Gregarious on the ground under brush in an alder and cotton-

wood thicket, Elwha River Ranger Station, Olympic National Forest, Washington, June 8 (14161 and 14165), June 10 (14249), and June 23, 1939 (14565 and 14566).

I have examined the type which was collected in California in 1902 by Copeland and have found cheilocystidia as well as pleurocystidia. From the original description one gets the impression that this is a short-stiped species. Frequently, however, this character is unreliable and must be very carefully studied before being given much emphasis. I have found specimens growing in grassy areas which had long stems and specimens in the woods on humus with moderately short stipes. Parker (16) stated that he had examined two collections, either one of which might have been the type. I located two collections at Albany, the one cited above from California and a second from Ohio by C. G. Lloyd. As I have observed this species, the striations of the pileus are not conspicuous, although they do extend nearly to the apex. Peck (17) described the pileus as striate to the apex when mature, Parker (16) described it as "striate on the apex when mature." The word *on* was apparently an error made in copying the original description. The fungus is properly placed next to *Psathyrella longipes* in a natural classification. It is readily distinguished from the latter by its smaller spores and more obtuse pileus.

Psathyrella Barlae (Bres.) comb. nov. (Pls. XVI and XXX, Figs. 3, 4, and 6). *Psathyra Barlae* Bres., *Fungi Trid.*, 1: 84, t. 91. 1887. —Pileus 3–4.5 cm. broad, obtusely conic when young, becoming plane or with a low broad umbo, surface glabrous on the disk and with a narrow fringe of whitish fibrils along the margin when young, glabrescent, color "warm blackish brown" to "dark livid brown" when young, the disk paler and watery grayish vinaceous, in age "russet-vinaceous" to "pale grayish vinaceous," hygrophanous, striate when moist, disk near "cinnamon buff" when faded, atomate, becoming faintly rugulose; flesh thin, firm, brittle, concolorous with the surface when either moist or faded, odor and taste mild; lamellae bluntly adnate, soon seceding, close to subdistant, 26–30 reach the stipe, 3 tiers of short individuals, moderately broad (4–5 mm.), "russet-vinaceous" when young,

tinged chocolate gray in age, edges even, pruinose under a lens; stipe 5–10 cm. long, 4–6 mm. thick, equal, hollow, fragile, "pale vinaceous-fawn" to "light vinaceous-fawn" beneath a coating of appressed white fibrils, appearing longitudinally fibrous striate and canescent, becoming sordid in age; spores 12–14×6–7.5μ, ellipsoid, with an apical hyaline germ pore, near "warm blackish brown" under the microscope (daylight) when fresh; cheilocystidia and pleurocystidia similar, 60–90×12–16μ, narrowly fusoid with a long neck, apices obtuse to somewhat tapered, hyaline; pileus-trama with a surface layer of vesiculose cells, the remainder floccose.

Gregarious to subcespitose on soil, Lake Crescent, Washington, June 10 (14247), June 22 (14525), and July 7, 1939 (14849). All of these, apparently, came from the same mycelium.

It is questionable whether or not *Psathyra bipellis* Quél. and *Psathyrella Barlae* are distinct species. The most important difference seems to be in stature. The specimens here referred to *P. Barlae* were large and grew subcespitose to gregarious. Those of *P. bipellis* reported from Michigan (26) were small and loosely gregarious. Since fungi of this type were found in only two localities, and because the collections from each locality fall readily into a described species, it seems best to recognize both, at least, until an intergrading series has been established.

Psathyra roseolus (Clements) Sacc. seems to be somewhat intermediate between *P. Barlae* and *P. bipellis* and on the basis of the description could be identified with either. I have not seen any authentic material, however, and for this reason hesitate to dispose of it either way. Ricken has placed *P. Barlae*, *P. bipellis*, and *Psathyra helobia* under *Psathyra corrugis*.

Psathyrella bifrons (Berk.) comb. nov. (Pl. XXX, Figs. 7 and 8). *Psathyra bifrons* (Berk.) Quél., *Champ. de Jura et Vosges*, Supp., 7: 52. 1879.—Pileus 1–3 cm. broad, obtusely conic, remaining so or the margin flaring slightly, sometimes campanulate, surface at first densely white fibrillose from the remnants of the universal veil, the fibrils becoming arranged into recurved evanescent scales, margin appendiculate, entirely glabrous in age, color be-

neath the scales pale buff and gradually changing to sordid cinnamon brown, hygrophanous, fading to sordid tan; flesh very thin and fragile, pallid to watery brown, odor and taste not distinctive; lamellae crowded, moderately broad, adnate, equal, white when young, soon tinged brownish and in age "cinnamon brown," finally with a smoky tinge, margin even; stipe 6–10 cm. long, 3–5 mm. thick, tubular, very brittle, watery white, covered by loose white fascicles of fibrils up to the densely pruinose apex, glabrescent, the base at times slightly enlarged; spores 8–10× 4–5μ, ellipsoid, dark fuscous brown in KOH, with an apical hyaline germ pore; cheilocystidia numerous, 40–62×8–12μ, saccate to broadly fusoid ventricose and in age subcylindric, hyaline; pleurocystidia none; gill-trama homogeneous; pileus-trama corticated by a surface layer of hyaline vesiculose cells, the remainder homogeneous.

Scattered on a pile of debris in a wet area near a spring, Lake Crescent, Washington, Oct. 6, 1935 (3000).

I have based my determination of the above collection on Rea's (20) description. He described the stipe as naked and minutely satiny. I have found that in most species of *Psathyrella* in which the universal veil is well developed the remnants of it are nearly always present on the stipe at least for a short time after the veil breaks. Because of the evanescent character of the fibrils in collection No. 3000, it does not seem wise to regard the discrepancy seriously. *P. bifrons* is very closely related to *P. frustulenta,* as Rea has indicated, but is readily distinguished by its fuscous brown spores (in KOH), which measure 8–10μ long, and its lack of pleurocystidia. Ricken (21) described the spores as 12–14×7–8μ and apparently had a different species.

Psathyrella candolleana (Fr.) comb. nov. *Hypholoma Candolleanum* (Fr.) Quél., *Champ. de Jura et Vosges,* p. 146. 1872. *Psathyra Candolleana* (Fr.) Singer, *Annales Mycologici,* 34: 339. 1936.

This species was very common in the river flats of the Olympics during the 1939 season. It was most abundant on debris, logs, and stumps of *Populus trichocarpa* and *Alnus rubra.* Although this is perhaps the commonest species in the genus, the literature on it

and related species is by no means clear either as to the number of species which should be recognized or the characters by which they are known. Burt (4) placed both *Hypholoma incertum* Pk. and *Hypholoma Candolleanum* in synonymy with *Hypholoma appendiculatum* and gave a very brief account of the situation. According to the International Rules of Nomenclature, however, one must start with Fries (1821) in naming agarics. Fries apparently placed a species similar if not identical with *Hypholoma hydrophilum* under the name *H. appendiculatum*, and since his time this name has come to be a constant source of confusion. Consequently, Lange's (13) suggestion that the name *appendiculatum* be dropped offers the best solution to the problem. *Candolleanum* is, apparently, the next oldest name, and I have used it here. *Hypholoma incertum* Pk. is merely an inconstant form of *P. Candolleana*. Parker (16) apparently tried to recognize all three of these, but his descriptions and discussion only add to the confusion.

I have studied the type of *Hypholoma cutifractum* and found cheilocystidia 28–36×10–15μ which varied in shape from saccate to cylindric or somewhat fusoid-ventricose. The pileus has the typical surface layer of vesiculose hyaline cells which characterize fragile species of *Hypholoma*. The spores measure 7–8(9)×4–5μ. They have an apical hyaline germ pore and are dull fuscous brown under the microscope. The basidia are either two- or four-spored. Macroscopically, I was unable to distinguish the specimens from dried fruiting bodies of *P. Candolleana*. As Harper (5) has pointed out, weather conditions cause the cracking of the cuticle. *H. cutifractum* has been placed in synonymy with *P. Candolleana*, and Parker re-established it. Parker (16) apparently placed great emphasis on Peck's notes (in which Peck described the pileus as not hygrophanous), on the absence of cystidia, and on the larger spores. According to my experience, all fragile purple-brown spored agarics with the cuticle of the pileus made up of vesiculose, hyaline cells are very hygrophanous. Consequently, I feel certain that Peck's notes are in error on this point. The specimens were probably faded when collected, an opinion substantiated by the cracks in the cuticle of the pileus. It should be remembered that

Peck did not collect the specimens himself. In regard to the cystidia, as stated above, cheilocystidia are present on the type, Parker's statement to the contrary, and the species thus resembles *P. Candolleana* in this respect also. Concerning the spores, my measurements are not significantly different from those for *P. Candolleana*. Parker also mentioned that the stipe of *H. cutifractum* is longer than that of *H. Candolleanum*. Unfortunately, this is a very unreliable character. In my Olympic Mountains material I have records of specimens with stems 13 cm. long, 1 cm. thick, and pilei 11 cm. broad. As can be readily seen from the above, *H. cutifractum* should be considered a synonym of *P. Candolleana*.

Psathyrella canoceps (Kauff.) comb. nov. (Pl. XXVI, Figs. 3 and 4). *Hypholoma canoceps* Kauffman, *Papers Mich. Acad. Sci.*, 5:132. 1926.

This species was found once, May 7, 1939 (13175), in the Hoh River Valley near the Jackson Guard Station, Olympic National Park. The colors of the pilei were "wood brown" to "avellaneous" beneath the white fibrillose covering and faded to "tilleul buff." The gills were "wood brown" and 24–26 reached the stipe. The pileus-trama is covered by a surface layer of vesiculose hyaline cells. Parker (16, p. 206) misquoted the original description in this statement: "Cystidia on sides of gills only." Actually, only cheilocystidia are present. The drawings were made from the type.

Psathyrella chondroderma (Berk.) comb. nov. (Pls. XVII and XXVI, Figs. 5–8). *Hypholoma chondrodermum* (Berk.) Lange, *Flora Agaricina Danica*, 4:78. 1939.—Pileus 2–5 (7.5) cm. broad, obtusely conic, becoming more or less expanded or broadly campanulate, often with a broad flattened umbo, glabrous except for the marginal fibrillose patches, when moist "russet" or "Mars brown," hygrophanous and fading to "tilleul buff" or sordid "cinnamon buff," surface frequently rugulose-reticulate around the disk and radially rugulose toward the margin, often fading first along the ridges, veil remnants whitish to pale cinnamon buff; flesh thin, fragile, concolorous with the surface; odor and taste mild; lamellae close (30–40 reach the stipe), bluntly adnate but

soon seceding, broad, 4–6 (7) mm., equal or tapering toward the margin of the pileus, "vinaceous-buff" when young, "verona brown" at maturity, edges whitish and crenulate; stipe 5–8 (10) cm. long, (3) 4–7 (10) mm. thick, equal, hollow, fragile, surface fibrillose, apical region fibrillose-pruinose, whitish at first but soon sordid avellaneous near the base and pale avellaneous toward the apex, fibrils also becoming discolored; spores 7–8×4–5μ, ellipsoid, with an apical hyaline germ pore, dark fuscous in KOH; basidia four-spored; cheilocystidia mostly saccate, 26–35×12–18μ, hyaline; pleurocystidia abundant, 38–52×10–13μ, ventricose, with obtuse subcaptitate or rounded apices, hyaline; gill-trama made up of hyphae with reddish brown walls (in KOH); pileus-trama with a surface covering of hyaline vesiculose cells several cells deep, homogeneous and of reddish brown-walled hyphae below.

Gregarious on debris and old logs of alder and cottonwood, Clearwater River, Washington, May 9, 1939 (13240); Hoh River, May 20 (13602); Lake Crescent, May 29 (13834); Hoh River, Olympic Mountains, Washington, June 30, 1939 (14705).

In the dried specimens the gills retain their dull reddish brown color. Lange (13) referred Ricken's (19) concept of *Hypholoma pertinax* to this species. The dark reddish brown or rusty brown colors of the pileus, the stipe which becomes sordid tan in age, the pleuro- and cheilocystidia and the small spores all characterize the species. In most of the members of this group the stipe remains white. In my specimens the veil remnants also changed color slightly, and the spores measured a little larger than those of European authors. These differences do not appear great enough to be significant. Lange (13) illustrated a much redder fungus than mine, but here again one can reasonably allow considerable variation. The rugose nature of the pileus is best observed on faded specimens.

Psathyrella coprobia (Lange) comb. nov. (Pl. XIII, Fig. 1, and Pl. XXXI, Figs. 1 and 2). *Psathyra coprobia* Lange, *Flora Agaricina Danica*, 4: 93. 1939.—Pileus 1–2.5 (3) cm. broad, obtuse to convex, becoming broadly convex, margin at first appressed

against the stipe, surface covered by a dense coating of white fibrillose scales or patches, margin fringed with the veil remnants, glabrescent and soon entirely naked, color "Prout's brown" to "cinnamon brown" (rusty brown), the margin faintly striatulate when moist, hygrophanous, fading to near "clay color" or sordid buff in age; flesh very fragile, watery cinnamon brown, thin, odor and taste mild; lamellae squarely adnate or slightly toothed, subdistant, 17–20 reach the stipe, 2 tiers of short individuals, broad (1 cm. at the stipe), "tilleul buff" (whitish) when young, "fuscous" at maturity, the edges whitish; stipe 3–5.5 cm. long, 1.5–2.5 mm. thick, white, equal, hollow, fragile, densely white fibrillose scaly up to the zone left by the broken veil, apex pruinose; spores 10–13×7–9μ, ellipsoid, dark chocolate color under the microscope (in KOH), with a hyaline apical germ pore; cheilocystidia and pleurocystidia similar, scattered to abundant, hyaline and with elongated necks, the apices not sharply pointed; basidia four-spored; gill-trama homogeneous, cell walls brownish in KOH; pileus-trama covered by a layer of vesiculose hyaline cells one cell deep, the tissue below with reddish brown walls in KOH.

Gregarious on horse dung, Lake Crescent, Washington, May 27, 1939 (13751–52), May 29 (13862), June 5 (14080), and June 9 (14200). A sterile form (13752) was found growing along with the fertile specimens. Instead of being white, however, the sterile individuals were pale cinnamon throughout. The two forms were indistinguishable when immature.

Kauffman (7) reported this species from Michigan under the name *Psathyra semivestita* Berk. & Br. A plant answering the European description of *P. semivestita* in every respect has been found on trash and debris in woods in North America. Although both species have much in common as to color, spore size, and shape and type as well as distribution of cystidia, they impress one as differing macroscopically. The gills of *P. coprobia* are much wider, and its universal veil is much more highly developed.

Psathyrella frustulenta (Fr.) comb. nov. (Pl. XXXI, Figs. 3–5).
Psathyra frustulenta (Fr.) Saccardo, *Syll. Fung.*, 5: 1070. 1887.—

Pileus 1.5–3 cm. broad, obtusely conic and with an appressed margin when young, becoming nearly plane in age or remaining unexpanded with a flaring margin, entire surface at first covered by a superficial coating of white fibrils which become arranged into recurved scales, glabrescent, the margin sometimes remaining appendiculate with patches of the broken veil, color "ochraceous-tawny" to "cinnamon brown," becoming "tawny-olive" to "buckthorn brown" and striate before fading, hygrophanous, fading to "cinnamon buff" more or less, sometimes old remoistened pilei are "russet" (dark rusty brown) over all; flesh very thin and fragile, brownish, odor and taste not distinctive; lamellae bluntly adnate, soon seceding, close (18–20 reach the stipe), broad (3 mm. ±), white or whitish when young, "russet" to "cinnamon brown" in age or with a smoky tinge, edges even and whitish; stipe 3–9 cm. long, 2.5–4 mm. thick, equal, hollow, very fragile, white or buff-tinged in age, apex silky to pruinose, lower part covered with scales or patches of white fibrils, glabrescent; spores 7–8×4–5μ, broadly ellipsoid, dark reddish brown in mounts of fresh material, pale reddish brown in KOH, with a very obscure apical germ pore (seen only with an oil immersion lens); basidia four-spored; cheilocystidia abundant, 34–42×9–12μ, saccate to fusoid ventricose with obtuse apices; pleurocystidia very abundant, 38–63×8–12μ, narrowly fusoid ventricose to subcylindric, apices not sharply pointed; gill-trama tawny brown in KOH; pileus-trama with a layer of vesiculose cells over the surface (2–3 cells deep), the remainder homogeneous and tawny brown in KOH.

Scattered to gregarious under ferns and on needle carpets under conifers, Orick, California, Dec. 3, 1935 (3728, 3735), and Dec. 4, 1937 (9390); at Kalaloch, Washington, May 2, 1939 (13061); and at Lake Ozette, Washington, May 15, 1939 (13421).

In collection No. 3728 a number of sterile fruiting bodies were found growing with the fertile specimens. These were practically pure white in all parts and when the veil remnants were removed looked exactly like white species of *Mycena*.

The cinnamon brown to russet color of the fertile gills is one of the most distinguishing characters of the species. This color

usually dominates that of the mature pileus causing the olive tints in the latter to become obscured. Old glabrous fruiting bodies might be mistaken for a *Conocybe*, but, as Ricken (21) has stated, a relationship to that group is lacking. In mass the spores have a slightly reddish appearance, and sometimes the gills even develop a smoky cast over the russet. Ricken's description of the gill- and spore-characters covers my specimens well. On the basis of my specimens, Lange's figures represent small pale specimens in which the veil is poorly developed. If it is demonstrated that the European material lacks pleurocystidia, a different disposition of my western collections will have to be made. Ricken and Lange do not mention the location of the cystidia, and Bresadola (1), although he illustrated them as occurring on the sides of the gills, gave the spores as 8–10μ long. In view of this discrepancy, it is obvious that he was dealing with a different species.

Psathyrella hymenocephala (Pk.) comb. nov. *Hypholoma hymenocephalum* Pk., *Ann. Rept. N. Y. State Mus.*, 31: 34. 1879. *Hypholoma cinereum* Parker and *Hypholoma fragile* Peck.

Psathyrella hymenocephala was reported (as *Hypholoma hymenocephalum*) for Michigan in 1935 (25). *H. cinereum* was described by Parker (16) in 1933 and reported from Michigan on the basis of Kauffman's specimens, which were described in the Agaricaceae of Michigan as *Hypholoma saccarinophilum* Pk. Since identifying *P. hymenocephala* I have been searching for *H. cinereum*, but have never found a species distinct from all others, which could be referred satisfactorily to it. During the wet summer of 1937 *P. hymenocephala* was very abundant. All the variations in size found among Peck's specimens were observed; some fruiting bodies had stipes 8–10 cm. long and 3–10 mm. thick. Their pilei measured up to 8 cm. broad. As in most species of *Psathyrella* the colors of the pileus of even mature individuals fade to sordid tan or ochraceous buff, and if the pileus becomes remoistened it assumes a livid appearance. In *P. hymenocephala* this change is more pronounced than in some others, but is hardly specific. Parker (16) described *H. cinereum* with the above-mentioned color change as its outstanding character. From my observations

of this color change in 1937, it was at once apparent that a critical study of *P. hymenocephala* and *H. cinereum* should be made. I have been unable to obtain material of the type of *H. cinereum* from Parker, but since his description follows that of Kauffman very closely, it seems apparent that he merely reworded Kauffman's account, and therefore, in the absence of more authentic specimens, one is justified in using Kauffman's as representative. Parker designated only the type locality, and as a result, his collection No. 1579 becomes the type, since it is the first one mentioned. An examination of Kauffman's two collections of *H. saccarinophilum* (sensu Agaricaceae of Michigan) reveals that they are identical with *P. hymenocephala* in stature, color of dried fruiting bodies, spores, cheilocystidia, and pileus-trama. The only possible difference, and the one Parker emphasized, is the color change of faded fresh material when it is remoistened. This, in the light of my 1937 observations, is also a character of *P. hymenocephala*. As a result, I have no hesitation in reducing *H. cinereum* Parker to synonymy with *P. hymenocephala*.

Hypholoma fragile Pk. is known from two localities in New York. One cited by Parker as the type locality, is Star Lake, St. Lawrence Co., and the other is Painted Post in Steuben Co. In the New York State Museum at Albany the Star Lake collection is marked as the type. I have studied both of these collections and obtained the following data: in the Star Lake collection (see Pl. XXVII, Figs. 3 and 11) the pileus-trama is homogeneous beneath a thin gelatinous pellicle made up of hyphae 1.5–2μ thick. Pleurocystidia are absent. Cheilocystidia are very abundant, measure 25–30$\times$4.5–5μ, and are narrowly fusoid to subcylindric with long narrow necks. The basidia are four-spored, and the spores measure 7–9 (10)$\times$4.5–5μ. They are pale brown in KOH mounts and have the typical hyaline apical pore.

The collection from Painted Post (see Pl. XXVII, Figs. 1 and 2) contains specimens with a layer of hyaline vesiculose cells forming the surface covering of the pileus. The layer is one or two cells thick. Pleurocystidia are absent. Cheilocystidia are present, measure 28–38$\times$10–14μ, and are saccate to slightly ventricose with broad obtuse apices. The basidia are four-spored, and the

spores measure 7–8.5×3.5–4.5μ. They are very pale brown under the microscope and have the typical apical hyaline germ pore. The difference in the character of the pileus-trama and width of cystidia in these two collections clearly indicates that each represents a different species. Peck (19) suspected this, and Murrill (14) also detected the difference. Peck apparently considered the Painted Post specimens typical because in his monograph (19, p. 80) he stated that "the specimens from Star Lake are smaller and more highly colored than the others but do not seem worthy of separation." He then went on to compare the species with *H. incertum*. In his illustrations (18, Pl. V, Figs. 1–7), which accompanied the original description, he pictured a species very closely resembling *H. incertum*. It is thus clear that Peck's concept from the beginning was that of a fragile species of the *H. incertum* group, and that the type should be selected to conform to this concept. The specimens from Star Lake are properly identified as *Hypholoma silvaticum* (Pk.) Smith.

A comparison of the Painted Post collection of *H. fragile* with authentic material of *P. hymenocephala* fails to reveal any distinct differences either macroscopically or microscopically. The spores of *P. hymenocephala* measure 6.5–7.5(8)×3.5–4μ and those of the Painted Post collection of *H. fragile* 7–8.5×3.5–4μ. Both are alike in the structure of the pileus, absence of pleurocystidia, and the size and shape of the cheilocystidia. In his original description of *H. fragile* Peck gave the spores as 8–10×4–5μ. These are the measurements of the spores in the Star Lake collection. Peck also stated that *H. fragile* is not hygrophanous. This is more likely to be true of *H. silvaticum* than of *P. hymenocephala*, but both are hygrophanous under normal conditions. It is evident that Peck included characters from both collections in the original description, and, according to the International Rules of Nomenclature, the name *H. fragile* must be discarded. If this point should be disputed the name would have to be placed under *Psathyrella hymenocephala* as a synonym.

Psathyrella longipes (Pk.) comb. nov. (Pls. XVIII and XXVII, Figs. 9 and 10). *Hypholoma longipes* Pk., *Bull. Torrey Bot. Club*,

22: 204. 1895.—Pileus 2.5–6 cm. broad, obtusely conic when young, either remaining conic with a flaring margin or becoming broadly campanulate, sometimes nearly plane, glabrous or with a few scattered fibrils near the margin, margin at first appendiculate with thin submembranous patches of white veil tissue, glabrescent over all in age, when young and fresh "cinnamon drab" to "avellaneous," at times becoming nearly "cinnamon brown," at maturity sordid livid brown, hygrophanous, fading to sordid "ochraceous-buff" or "tilleul buff," surface faintly striate when moist, lubricous to subviscid and smooth, somewhat atomate when faded; flesh thin, concolorous with the surface, firm and not markedly fragile, odor and taste mild; lamellae ascending adnate to horizontally adnate (old caps), readily seceding, close to crowded (36–40 reach the stipe), narrow to moderately broad (4 mm. ±), equal, "tilleul buff" when young, becoming "hair brown" or in age nearly black, edges even; stipe 9–16 cm. long, 3–6 mm. thick, equal or the base slightly and gradually enlarged, hollow, cavity large, rigid, strict, fragile, white, with minute appressed white fibrils when young, soon glabrous except for the pruinose apex and sometimes striate; spores 12–14 (15)×6.5–8μ, ellipsoid to subovoid, dark blackish brown under the microscope (in KOH), with a hyaline apical germ pore; basidia 20–24×7–8μ, four-spored; cheilocystidia 30–38×8–10μ, fusoid ventricose with obtuse apices; pleurocystidia not differentiated; pileus-trama with a rather thick layer of vesiculose hyaline cells over the surface (3–4 cells deep).

Gregarious under alder, Elwha River Ranger Station, Olympic National Forest, Oct. 23, 1935 (3318), June 8, 1939 (14166), June 10 (14250), June 16 (14406), June 22 (14535 and 14542), June 23, 1939 (14580). A sterile collection (14535) was found on June 8, 1939. It was almost pure white throughout and looked like a gigantic white *Mycena*.

The above is a description of the specimens I have collected and studied. The type was examined and the following data obtained: microscopically the pileus of the type is characterized by a thick layer of vesiculose hyaline cells over the surface. The basidia are four-spored, the cheilocystidia are saccate to fusoid ventricose

and measure 30–38×10–13μ; pleurocystidia are not differentiated, and the spores are 10–13×7–9μ. They are broadly ellipsoid to subovoid, have hyaline apical germ pores, and are dark blackish brown in KOH mounts. Macroscopically, my specimens are indistinguishable from the type.

It is to be noted that the spores of the Elwha River collections measure slightly longer than those of the type. In material which Miss Elizabeth Morse of Berkeley, California, sent to me, one collection has spores exactly as in the type and in another many individuals measure up to 14μ long and are ellipsoid rather than ovoid. In view of the small amount of difference in size and the observed variation in one pileus of one of the California collections, the difference does not appear significant.

In my collections the pileus was not noticeably yellowish brown when fresh. Here, however, there are only the meager notes of McClatchie which Peck used to describe the species. My specimens varied from grayish brown to cinnamon brown (this in the yellow-brown series). When one considers the great range of color variation in *Stropharia longistriata* and *Psathyrella Candolleana* it is difficult to convince oneself that the apparent difference here is usable taxonomically. The possible correlation of the colors and smaller spores should be kept in mind, however, in future studies.

An examination of the type of *Hypholoma campanulatum* Pk. revealed the same microscopic characters as those given above for the type of *P. longipes*. My spore measurements were 10–12×7–8μ. Parker (16) gave them as 9–11×6–8μ. Many spores of the type are light brown and obviously immature. A smaller number of dark blackish brown spores were found, however, and my measurements were made from these. Since Parker reported the spores as light brown he was very likely considering the immature individuals. Parker suspected that *P. longipes* and *H. companulatum* were the same, and my examination of the two types has also convinced me of their similarity. *H. campanulatum* should be referred to *P. longipes* as a synonym.

Psathyrella madeodisca (Pk.) comb. nov. (Pl. XXVIII, Figs. 1–5). *Hypholoma madeodiscum* Pk., *Ann. Rept. N. Y. State Mus.*,

38: 88. 1885.—Pileus 3–8 cm. broad, ovoid to obtusely conic when young, becoming broadly convex to plane, the margin frequently wavy, occasionally the disk raised slightly, glabrous or with a faint white fibrillose zone near the appendiculate margin, veil remnants white and soon disappearing, when moist "russet" to "Prout's brown" or "cinnamon brown," hygrophanous and fading to "cinnamon buff," "ochraceous-buff" or "warm buff" and becoming atomate, striatulate when moist, smooth or somewhat rugulose when faded; flesh thin but firm, pallid watery brown when moist, whitish when faded, odor and taste not distinctive; lamellae close to crowded, bluntly adnate and readily seceding, moderately broad (narrow when young), pallid grayish to pale brown at first, becoming pale fuscous brown, edges even; stipe 8–12 cm. long, 4–8 mm. thick, equal or sometimes with a vermiform pseudorhiza extending horizontally under the fallen leaves, hollow, fragile, white, unchanging, base white tomentose, silky and sometimes striate above, mid-part appressed fibrillose but becoming glabrous; spores 7–8.5×3.5–4.5μ, narrowly ellipsoid, dark fuscous brown in KOH under the microsocpe, with a hyaline apical germ pore; basidia four-spored; cheilocystidia 25–36×10–20μ, saccate, hyaline, abundant; pleurocystidia (35) 40–50×10–18μ, ventricose with short thick necks and broadly rounded apices; gill-trama very pale brownish; pileus-trama corticated by a thin layer of hyaline vesiculose cells, the remainder homogeneous and brownish in KOH.

Gregarious to scattered in beech and oak woods on fallen leaves, Ann Arbor, Michigan, Oct. 3, 1936 (5008); Sharron Hollow, near Chelsea, Michigan, June 10, 1937 (6282); Pontiac, Michigan, June 11 (6285) and June 15 (6319); Kent Lake, Oakland Co., Michigan, Sept. 17, 1938 (10947); Silver Lake, near Dexter, Michigan, Sept. 23, 1939 (11052).

The specimens cited above are constant in their characters as described and differ slightly from those of the type in the following manner: the spores in Peck's type measure 5–5.5μ wide as against 3.5–4.5μ in my collections. The pleurocystidia of the Michigan material are much broader and more obtuse than those in Peck's type. My specimens were all gregarious to scattered on humus

rather than on decaying wood. I hesitate to use these characters as the basis for a new species because even when taken together they do not stand out as being unquestionably distinctive. Cystidia of the shape found in the Michigan specimens often show a decided tendency to elongate. This can be observed frequently on such common species as *Psathyrella hydrophila*. In order to establish as constant such a small difference in the width of the spores one would have to measure spores from a large number of collections of both forms. Parker (16) commented on the relationship of this species to *P. hydrophila* (*Hypholoma hydrophilum*). The specimens reported from Michigan by Kauffman under the name *Hypholoma hydrophilum* sensu Saccardo with spores 7–8×4–5μ belong here. Although Parker did not mention it, the spore size is the most reliable difference between *P. madeodisca* and *P. hydrophila*. In the part of the type of *P. madeodisca* which I studied the pleurocystidia were very abundant.

Hypholoma appendiculatum sensu Parker, on the basis of his description, has no characters which separate it clearly from *P. madeodisca*. It appears advisable, in view of the confusion surrounding the name *appendiculatum*, to use a name based on an existing well-preserved type rather than on an older doubtful name. Consequently, Peck's name is preferred.

Psathyrella oblongispora (Parker) comb. nov. (Pl. XXVII, Figs. 4–8). *Hypholoma oblongisporum* Parker, *Mycologia*, 25: 179. 1933.—Pileus 3–8 cm. broad, obtusely conic and with a slightly incurved margin when young, becoming conic-campanulate or plane and with an obtuse umbo, occasionally broadly convex, surface sometimes covered when young with a thin coating of superficial white fibrils, usually glabrous except for the white fibrillose patches adhering along the margin, smooth when moist, "Prout's brown," "russet," or "cinnamon brown" when moist, faintly striatulate, hygrophanous, fading to "ochraceous-tawny" on the disk and "tilleul buff" over the marginal area, sometimes "pinkish buff" over all when faded or merely pale avellaneous; flesh moderately thin and fragile, brownish, odor and taste mild; lamellae adnate but soon seceding, close (24–35 reach the stipe),

narrow but becoming broad (3 mm. to 5–7 mm.), "tilleul buff" when young, "wood brown" to "hair brown" at maturity, in age near "benzo brown," edges even and whitish; stipe 5–8 cm. long, 3–8 mm. thick, equal or narrowed slightly toward the apex, hollow, white, fragile, surface white fibrillose or fibrillose scaly, appressed fibrillose toward the more or less striate apex; spores 6–8 $\times$3.5–4μ, somewhat oblong, dark fuscous under the microscope in KOH, with a broad hyaline apical germ pore; basidia four-spored; cheilocystidia numerous, saccate or elongated and fusoid ventricose, 30–40$\times$10–15μ in the former and 42–58$\times$9–12μ in the latter; pleurocystidia very abundant, hyaline, 48–60$\times$9–12μ, ventricose, with a long neck ending in a subacute apex, the apex often appearing as if slightly roughened because of an adhering amorphous substance; gill-trama nearly hyaline; pileus-trama with a surface layer of vesiculose hyaline cells several cells deep, the part beneath this homogeneous and with the hyphae having reddish brown walls in KOH.

Gregarious to subcespitose on alder and cottonwood debris, Hoh River, Olympic Mountains, Washington, May 7, 1939 (13178); Clearwater River, May 9 (13239 and 13241); Hoh River, May 20 (13603) and May 18 (13518); Lake Crescent, Washington, May 29 (13852); Forks, Washington, May 31 (13915); Hoh River, June 6 (14143); Elwha River, June 23 (14578); Clallam Bay, June 24 (14606); along the Hoh River, June 30, 1939 (14706).

This species is intermediate between *P. hydrophila* and *P. madeodisca*. Its larger spores and somewhat pointed pleurocystidia separate it from *hydrophila*, and its narrower spores and more pointed cystidia separate it from *madeodisca*. Parker (16) commented on the relationship mentioned above.

I hesitated to recognize the Olympic Mountains collections as Parker's species because of the decided difference in the size of the fruiting bodies, and because Parker described his fungus as having filiform brown strands of hyphae superficial or aggregated into very small patches on the pileus. In the abundance and shape of the cystidia and the shape and size of the spores my specimens appear to be similar to his. Size of the fruiting body is a notoriously variable character, particularly in the Pacific coast area, but the

color of the universal veil is important. Had the universal veil been a distinct brown, however, there should also have been brown fibrils near the base of the stipe on at least the young specimens. Parker described the stipe as white and illustrated young individuals. I have been unable to obtain specimens of the type to check my identification, and, in view of the numerous errors in his work, I am inclined to consider Parker's comment as an inaccurate statement.

Psathyrella obtusata (Fr.) comb. nov. *Psathyra obtusata* (Fr.) Gillet, *Les Hyménomycètes*, p. 591. 1874—Pileus 1–2.5 cm. broad, obtusely conic when young, becoming broadly conic in age or expanding to campanulate, surface at first with a few fugacious white fibrils from the remains of the rudimentary veil, soon glabrous over all, "buckthorn brown" to watery "clay color" when moist, hygrophanous, fading to near "vinaceous-buff" or "tilleul buff," radially rugulose when faded; flesh thin, fragile, concolorous with the surface, odor and taste mild; lamellae moderately close (22–24 reach the stipe), bluntly adnate and soon seceding, broad (4 mm. ±), "drab-gray" at maturity, edges faintly whitish and scarcely fimbriate; stipe 4–6 cm. long, 2–3 mm. thick, equal and strict, fragile, hollow, whitish, with thin white fibrillose flecks from the remains of the veil, glabrescent, apex pruinose; spores 6–7×3.5–4μ, pale reddish brown in water mounts of fresh material, pale fuscous brown in KOH, with a very small apical germ pore, ellipsoid to slightly bean-shaped; basidia four-spored; cheilocystidia of two types, saccate and 18–26×10–15μ or fusoid ventricose to subcylindric and 32–54×8–12μ, both types hyaline, smooth and with thin walls; pleurocystidia abundant, 42–60×8–12μ, subcylindric to ventricose with elongated necks, apices obtuse; gill-trama homogeneous; pileus-trama with a surface covering of somewhat elongated inflated hyaline cells 1–2 cells deep, the remainder homogeneous.

Scattered under brush on humus and debris, Lake Crescent, Washington, May 29, 1939 (13851).

The above collection agrees with Lange's account of *Psathyra obtusata* remarkably well in all characters except that of the veil.

I do not consider this a serious discrepancy. Romagnesi (22) has pointed out, and I have verified it in the field many times, that nearly all fungi of this type have rudimentary veils which can be observed at least in button stages. In certain species one may find collections with no trace of a veil even on buttons at one time, and a few days later in the same place find new fruiting bodies coming up in which a slight veil is present. The small spores and cystidia on the sides and edges of the gills are the characters which distinguish *P. obtusata*.

PSATHYRELLA PRONA (Fr.) Gillet.—Pileus 6–12 mm. broad, up to 15 mm. high, ovoid, becoming obtusely conic or campanulate, glabrous except for scattered fibrils over the marginal area at first, soon glabrescent, translucent striate, smooth and sordid "buckthorn brown" when moist, the marginal area soon "wood brown," hygrophanous, fading to "avellaneous" or paler over all, atomate and somewhat rugulose when faded, sometimes tinged pinkish in age; flesh very thin and fragile, concolorous with the pileus when moist or faded, odor and taste not distinctive; lamellae ascending adnate, subdistant (15± reach the stipe), very broad (3 mm.), pale grayish brown (near avellaneous) when young, becoming "benzo brown" to "fuscous" at maturity, edges white fimbriate or sometimes pinkish; stipe 3–6 cm. long, 1–1.5 mm. thick, equal, hollow, very fragile, hyaline white to "tilleul buff" or more grayish toward the base, with very thin evanescent patches of veil remnants below, base slightly strigose, apex pruinose; spores 13–15×7–8μ, with a hyaline apical germ pore, ellipsoid, very dark fuscous under the microscope; basidia four-spored, cheilocystidia 38–50×10–15μ, abundant, fusoid ventricose with subacute apices, hyaline (occasionally with pinkish sap); pleurocystidia rare, similar to cheilocystidia or broader; gill-trama homogeneous; pileus-trama with a layer of vesiculose hyaline cells (one cell deep) over the surface, the remainder homogeneous but of very broad hyphae.

Scattered in a barnyard around an old straw stack, Lake Crescent, Washington, May 29 (13859), June 5 (14080), and July 5, 1939 (14782).

In all of my collections the pileus was characterized by a layer of vesiculose cells only one cell deep over the surface of the pileus. I have a collection of a somewhat similar agaric from Michigan in which this layer is several cells deep. This appears to be *Psathyrella atomata*. It is possible that here the thickness of the cellular surface layer may be of importance in distinguishing between two otherwise very similar species.

Psathyrella semivestita (Berk. & Br.) comb. nov. (Pls. XIX and XXXII, Figs. 1–3). *Psathyra semivestita* (Berk. & Br.) Sacc., *Syll. Fung.*, 5: 1071. 1887.—Pileus 10–30 mm. broad, ovoid to obtusely conic when young, becoming campanulate or convex, at times remaining unexpanded but with a flaring margin, surface more or less glabrous around the disk, with white fascicles of fibrils near the appendiculate margin, not scaly, glabrescent, striatulate when moist, color variable, "Mars brown," "cinnamon brown," or "Prout's brown" when fresh and moist (dark rusty brown to more yellowish brown), hygrophanous and fading to near "wood brown" or a sordid tan, usually fading along the margin first; flesh very thin, moderately fragile, "cinnamon brown" when moist, sordid tan faded, odor and taste mild; lamellae ascending but bluntly adnate and soon seceding, close (21–25 reach the stipe), 3 tiers of short individuals, moderately broad (2–3 mm.), pallid at first, soon becoming "wood brown," edges even; stipe 4–12 cm. long, 1.5–3 mm. thick, equal, strict, tubular, fragile, delicately appressed fibrillose from scant veil remnants, apex pruinose, base faintly mycelioid, more or less glabrescent in age, white becoming tinged with sordid buff; spores 10–12 (14)×5.5–6.5μ, ellipsoid, with a hyaline apical germ pore, dark fuscous (in KOH) under the microscope; basidia four-spored; cheilocystidia and pleurocystidia similar, moderately abundant, 32–50×9–13μ, fusoid ventricose with subacute apices, hyaline, smooth; gill-trama homogeneous, cells with brownish walls in KOH; pileus-trama with a layer of vesiculose cells over the surface (one cell deep) from which scattered cystidia project, tramal body homogeneous, the hyphae with brown walls in KOH.

Gregarious on wet leaves, Elwha River Ranger Station, Olym-

pic National Forest, Washington, June 23, 1939 (14560). It was also found at Lake Timagami, Ontario, on several occasions during the season of 1936. For comments on the species Kauffman (7) placed under this name see *P. coprobia*. **Psathyrella vestita** (Pk.) comb. nov. (*Psathyra vestita* Pk., *Bull. N. Y. State Mus.*, 105: 28. 1906) is readily distinguished from both of these by its smaller spores (8–10×5–5.5μ—my own measurements from the type) and more obtuse and inflated cystidia. In my interpretation of the English species I have relied upon Rea's (20) description and Cook's (3) illustration.

Psathyrella similis (Parker) comb. nov. (Pl. XXVIII, Figs. 6–9). *Hypholoma simile* Parker, *Mycologia*, 25: 195. 1933.—Pileus 2–3 cm. broad, ovoid in button stages, becoming obtusely conic to campanulate, surface at first covered over all with scattered patches of buff fibrils, the margin appendiculate with veil remnants, soon glabrescent over all, evenly "russet" or darker when young, becoming paler and near "cinnamon brown" before fading, hygrophanous, fading to dark tan on the disk and sordid grayish buffy brown toward the margin, sometimes nearly "cinnamon buff" over all, atomate; flesh concolorous with the surface, very thin and fragile, odor and taste mild; lamellae bluntly adnate, broadest (3–4 mm.) at attachment and tapered evenly toward the margin of the pileus, readily seceding, close, pallid cinnamon brown when young, soon dark fuscous brown, edges whitish; stipe 4–5 cm. long, 2–3 mm. thick, equal, strict, fragile, hollow, white, base with a rather copious white mycelium, lower part sparsely white fibrillose, toward the apex densely floccose-pruinose; spores 8–10.5×6μ, ellipsoid, very dark chocolate brown under the microscope (in KOH), with an apical hyaline germ pore; basidia four-spored; pleurocystidia scattered, ventricose with narrowed necks, 30–48×10–15μ; cheilocystidia similar or more saccate; gill-trama dark russet brown in KOH; pileus-trama with a layer of hyaline vesiculose cells over the surface (one cell deep), the remainder homogeneous and with rusty brown hyphae.

Gregarious on birch debris on low ground, Pinckney, Michigan, Sept. 24, 1938 (11072).

Parker described this species from a collection by Overholts from Missouri. It has been known previously, apparently, only from the type locality. My determination is based on the original description and Parker's comments accompanying it. If one compares the above description with the original, certain discrepancies are apparent which require some explanation. Parker (16, p. 195) stated that his species "resembles the plants which Lange places in his Psathyroide group." All such plants have the layer (one or more cells deep) of vesiculose hyaline cells over the surface of the pileus, are typically hygrophanous, and become atomate when faded. Hence I assume that these are characters of *P. similis*, although from the description such is not clearly evident. The colors of *H. simile* are described as "gray or often ochraceous or cinnamon-buff when young or on the disk, frequently cream colored." These are the colors of my faded specimens. Parker stated, in addition: "At times subviscid but usually dry, subglabrous or minutely atomate." These, except for the viscidity, are also characters of faded pilei. Obviously, the viscidity was not distinct. Lange (13) has pointed out that if the vesiculose cells forming the surface of the pileus collapse somewhat, a subviscid feel results. I have verified this in the field for several species. It is very likely to be evident if old faded pilei are remoistened. I am inclined to explain the viscidity Parker mentioned as being caused by the partial collapse of these surface cells. Parker also stated that cheilocystidia are absent. This statement is very likely based on an error in observation. His statements in regard to this character for other species have been shown to be incorrect (Smith, 24).

Parker considered *P. similis* to be closely related to *Psathyrella delineata* (Pk.) comb. nov. (*Hypholoma delineatum* Pk., *Bull. N.Y. State Mus.*, 150: 83. 1911). From a study of the type of the latter I find its spores measure 6.5–8×4.5–5μ, and that the pleurocystidia differ distinctly in shape. In my estimation *P. simile* is much more closely related to *Psathyrella hymenocephala* than to *delineata*. Its stature, colors, consistency, and habit are sufficient to cause the two to be confused. The microscopic characters clearly separate them.

Psathyrella spadiceogrisea (Fr.) comb. nov. (Pls. XX and XXXII, Figs. 4–7). *Psathyra spadiceogrisea* (Fr.) Quél., *Champ. de Jura et Vosges*, p. 149. 1872.—Pileus (1) 3–5 cm. broad, ovoid to obtusely conic, becoming broadly umbonate to subcampanulate, often nearly plane with a decurved margin, margin appressed against the stipe at first and sometimes flaring or slightly recurved in age, striate, glabrous except for a fringe of evanescent fibrils along the margin, moist, smooth or slightly wrinkled, "Mars brown" to "russet" or "cinnamon-brown," hygrophanous, fading to "ochraceous-tawny" on the disk and pale buff over the marginal area; flesh moderately thin and not exceptionally fragile, watery brown moist, buff when faded, odor slightly acidulous, taste mild; lamellae adnate, soon seceding, crowded (28–36 reach the stipe), moderately broad (4 mm. ±), 3 tiers of short individuals, whitish at first, becoming dull purplish brown, edges even; stipe 8–14 cm. long, 3–5 mm. thick, equal, hollow, fragile, pure white when young, slightly sordid in age, faintly fibrillose, soon glabrescent, base white mycelioid; spores 6.5–8×4–5μ, ellipsoid to slightly bean-shaped, dark chocolate brown under the microscope in KOH, with an apical hyaline germ pore; basidia four-spored; cheilocystidia of two types, saccate and fusoid ventricose, the former abundant, hyaline, thin-walled and measuring 18–38×10–18μ (varying greatly in size), the latter are rare, have obtuse apices, and measure 28–35×9–12μ; pleurocystidia abundant, 40–54×8–14μ, fusoid ventricose with obtuse apices; gill-trama homogeneous, hyaline to faintly brownish in KOH; pileus-trama with a surface layer of vesiculose and pear-shaped cells intermingled, layer one cell deep but not organized into a palisade, tramal body homogeneous, cell walls brownish in KOH.

Gregarious to scattered, Sharron Hollow, near Chelsea, Michigan, May 23, 1937 (6207) and May 27 (6228).

During the spring of 1938 a form was found at Saginaw Forest, near Ann Arbor, in which the colors were "Dresden brown" to "Prout's brown" and faded to "avellaneous" or "wood brown." The very young buttons were "avellaneous" when moist. The pilei measured 1–3.5 cm. broad and were more umbonate than

those described above. The stipes were 4–8 cm. long and 2–5 mm. thick. The rather thick stipe, small spores, cystidia, and layer of inflated cells over the surface of the pileus (one cell thick and made up of vesiculose and pear-shaped cells intermingled) identify the collection as *P. spadiceogrisea*. Stature and color are very unreliable characters in *Psathyrella*, and it appears best to have a correlated microscopic difference before placing much emphasis upon them. Bresadola (1) illustrated cystidia with slightly thickened walls. I have not observed such cystidia on my specimens.

Psathyrella subnuda (Karsten) comb. nov. (Pls. XXI and XXXII, Figs. 8–10). *Psathyra subnuda* Karsten, *Symb. Myc. Fenn.*, 10: 60. 1883.—Pileus 3–6 cm. broad, ovoid or very obtuse, becoming broadly convex, plane or with a broad low umbo, the margin sometimes recurved in age (when young, appressed against the stipe), glabrous or with a very slight fringe of fibrils along the margin, striatulate when moist, hygrophanous, "Prout's brown," "buckthorn brown," "cinnamon-brown," or "sepia," hygrophanous and fading to "clay color" or "cinnamon-buff," often glistening when faded, usually fading first around the disk; flesh concolorous with the surface, thickish under the disk, thin toward the margin, fragile, odor and taste mild; lamellae bluntly adnate and soon seceding, moderately broad (3 mm.±), close (29–33 reach the stipe), "tilleul buff" when very young, becoming sordid brownish and finally "light drab" at maturity, edges even; stipe 4–8 cm. long, 3–7 mm. thick, equal, hollow, fragile, glabrous, white, often transversely undulate but not flexuous, apex sometimes faintly pruinose; spores (7) 8–10×5–6.5μ, subovoid to broadly ellipsoid, dark fuscous under the microscope, with a hyaline apical germ pore; basidia four-spored; cheilocystidia saccate or broadly ventricose with a short slightly constricted neck, very obtuse; pleurocystidia scattered, 36–54×10–16μ, ventricose with thick necks and very obtuse apices, hyaline, smooth; gill-trama homogeneous, pileus-trama with a surface layer of vesiculose cells 2–3 cells deep, remainder homogeneous and sordid brown, the color apparently situated in a deposit along the walls.

Gregarious to scattered on cottonwood and alder debris, Hoh

River, Olympic Mountains, Washington, May 7 (13184); Clearwater River, Washington, May 9 (13255); Lake Crescent, Washington, June 5 (14088); Hoh River, June 6 (14119); Joyce, Washington, June 9 (14269) and June 20, 1939 (14505).

Lange (13) has described and figured specimens somewhat smaller than mine, but all of the important characters are in perfect agreement, particularly the spores. The broad somewhat ovoid spores are quite distinctive in this group of species. The colors, as is true for most species of *Psathyrella*, vary considerably from light to dark brown. When one encounters large darkly colored forms he is likely to try to place them in *Psathyra fusca*. The spores, however, should distinguish such forms at once.

PSATHYRELLA TREPIDA (Fr.) Gillet.—Pileus 1–3 cm. broad, obtusely conic, remaining conic or becoming campanulate, glabrous, the extreme margin at first decorated with scattered fibrils from the rudimentary veil, moist, "russet" to "Mars brown" and becoming "ochraceous-tawny" before fading, hygrophanous, fading to "cinnamon buff" in young specimens and "wood brown" in old ones, faded parts becoming tinged pinkish (near "vinaceous-fawn"), striate when moist, smooth and atomate when faded; flesh equal, very thin and fragile, concolorous with the surface, odor and taste not distinctive; lamellae adnate, somewhat ascending, readily seceding, close to subdistant (18–20 reach the stipe), almost equal, moderately broad (3 mm.), pallid, soon pale fuscous brown, edges even; stipe 4–4.5 cm. long, 1.5–2 mm. thick, equal cartilaginous-brittle, stuffed with a white pith which can sometimes be removed in the form of a thin rod, sometimes hollow, white, grayish white or tinged sordid buff over the lower part, decorated below with small patches of fibrils, glabrescent, faintly pruinose toward the apex; spores 12–14×6–6.5μ, narrowly ellipsoid, dark chocolate brown (in KOH) under the microscope, with an apical hyaline germ pore; basidia four-spored; cheilocystidia abundant, mostly saccate, thin walled, 18–28×9–15μ, some are fusoid ventricose and measure 32–40×9–14μ; pleurocystidia 32–44×9–15μ, ventricose with obtuse apices and long or short necks, moderately abundant; gill-trama homogene-

ous, hyphal walls brownish in KOH; pileus-trama with a surface layer of vesiculose cells loosely arranged and one cell deep, homogeneous beneath, the hyphae with brownish walls in KOH.

Singly on fallen leaves and trash, Lake Crescent, Washington, June 9 (14188), June 22 (14524), July 4 (14749), and July 5, 1939 (14792).

The long and relatively very narrow spores are distinctive. I do not believe the development of a pinkish pigment in the sap of the vesiculose cells which cover the pileus and in the cheilocystidia is a sufficiently constant character to be taxonomically valuable. All of the collections cited above were from the same trash heap, but the color change was present only in the first two. I have noted this color change in several species of *Psathyrella*.

Stropharia Kauffmanii sp. nov. (Pl. XXIII).—Pileus 6–15 cm. latus, convexus, siccus, innate squamosus vel fibrillosus, pallide fulvus; lamellae adnatae, confertae, angustae, pallidae demum lividae; stipes 6–10 cm. longus, 1.5–3 cm. crassus, squamosus; sporae 6–7×4–4.5μ. Specimen typicum legit prope Clearwater River, Olympic Mountains, Washington, May 9, 1939, A. H. Smith, n. 13256, in Herb. Univ. Michigan conservatum.

Pileus 6–15 cm. broad, broadly convex with an incurved margin, remaining convex with a spreading margin or becoming plane, surface dry and densely innately fibrillose scaly, scales more or less squarrose over the disk and merely recurved toward the fringed margin, scales "wood brown," "tawny-olive," "ochraceous-tawny" or "cinnamon brown," ground color distinctly yellowish ("warm buff"); flesh thick, 1.5 cm. ± over the disk, abruptly tapering to the margin, white, soft but not fragile, odor and taste subnauseous; lamellae depressed adnate, often attached only by a tooth, crowded (65–115 reach the stipe), very narrow (2–3.5 mm.), very thin and breaking transversely readily, pallid but soon becoming "drab," often crisped, edges often eroded; stipe 6–10 cm. long, 1.5–3 cm. thick, equal more or less, often compressed, hollow, fleshy, firm, whitish within, surface whitish but strongly tinged "cream color" toward the base, squarrose scaly above and below the superior submembranous evanescent

annulus, becoming fibrillose scaly in age (the scales above the ring are formed by the broken cuticle, those below are made up of lacerated stem tissue and veil tissue combined), base furnished with numerous white rhizomorphs; spores 6–7×4–4.5μ, ellipsoid, lacking an apical germ pore, dull reddish brown under the microscope, "army brown" or near it in mass; basidia four-spored; cheilocystidia 50–60×10–12μ, subcylindric to subfusoid, apices acute or obtuse; pileus-trama homogeneous with aggregations of fibrils projecting from the surface layer which cause the conspicuous scales.

Singly to gregarious under brush piles in woods of alder, maple and cottonwood, Clearwater River, Olympic Mountains, Washington, May 9, 1939 (13256-type); near Graves Creek Inn, on the south fork of the Quinault River, May 23 (13703); along the Hoh River, near the Jackson Guard Station, Olympic National Park, May 20 (13600); and along the Elwha River, June 12 (14287) and June 23, 1939 (14585). Kauffman collected it at Lake Quinault, Washington, in 1925. He recognized it as a new species, but had not published it.

Stropharia Kauffmanii is one of the most distinctive species of *Stropharia* known. The fibrillose character of the pileus reminds one of that of *Boletinus cavipes;* in fact, if one did not take the trouble to pick up a specimen and look at the under side, one could easily mistake it for that species. Its relationships within the genus are a bit obscure. It does not belong with such fungi as *Stropharia squamosa* or *Stropharia depilata* and has no relationship whatever with the section Spintrigerae. In the ocher-brown-spored fungi its closest parallel is in the *Pholiotas* of the *P. squarrosa* type.

Stropharia silvatica sp. nov. (Pl. XXII).—Pileus 2–4 cm. latus, obtusus, demum umbonatus, viscidus, glaber, subcrustulinus demum pallide luteus; lamellae adnatae, ventricosae, confertae, albidae demum subolivaceae vel sordide brunneae; stipes 8–16 cm. longus, 3–5 mm. crassus, valde radicatus, fragilis, viscidus, luteus, sursum pallidus; annulus evanescens; sporae 10–12.5× 5.5–7.5μ. Specimen typicum legit prope Kalaloch, Washington,

May 2, 1939, A. H. Smith, n. 13059, in Herb. Univ. Michigan conservatum.

Pileus 2–4 cm. broad, obtuse, the margin incurved slightly at first, becoming plane or with an obtuse umbo, the margin at first decorated with veil fragments, glabrous otherwise, viscid to glutinous, evenly "amber brown" or "argus brown" in button stages, soon fading to "amber yellow" along the margin and in age only the disk or umbo remaining amber brown, the remainder "chamois," not translucent striate; flesh concolorous with the surface, watery, moderately thin and pliant, odor and taste mild; lamellae adnate with a tooth and readily seceding, ventricose and broad (5–6 mm.), close, 27–30 reach the stipe, 2–3 tiers of short individuals, white when young, becoming "deep olive-buff," finally "Saccardo's umber" in age, edges even; stipe 8–16 cm. long, 3–5 mm. thick, equal above a long (4–6 cm.) pseudorhiza, solid or with a narrow tubule, viscid over the lower two-thirds and sordid "honey yellow," upper part whitish but becoming "marguerite yellow," a thin white inner fibrillose veil present beneath the gelatinous veil, annulus apical, evanescent, usually merely a fibrillose fringe, below the annulus often more or less concentrically zoned from the drying gluten; spores 10–12.5×5.5–7.5μ, ovoid, greenish yellow under the microscope when fresh, ochraceous tawny in mounts revived in KOH, with a hyaline apical germ pore; basidia four-spored, 30–32×8–10μ; cheilocystidia abundant, 28–36×10–14μ, obtuse, clavate, hyaline, smooth, some have a highly refractive content (in KOH); pleurocystidia abundant, 34–42×10–12μ, broadly fusoid ventricose to obtuse, often with refractive contents (in KOH) or brownish and metalloid; gill-trama not distinctive; pileus-trama with a gelatinous pellicle made up of cells 4–5μ thick, the walls brownish and pitted or with annular rings, hypodermis not differentiated, tramal body homogeneous and floccose.

Singly under cedar and hemlock, Kalaloch, Washington, May 2, 1939 (13059–type); near Oil City, Washington, May 4 (13097) and May 18, 1939 (135515).

This species is most closely related to *Stropharia semigloboides* Murr. It is readily distinguished by its spores and brown color. It

lacks the differentiated hypodermis of Murrill's species and also has a much more fragile stipe. Both have pleurocystidia. These organs were overlooked in my first study (28) of *S. semigloboides*. They are very inconspicuous, measure 33–38×10–12μ, and are similar to those of *S. silvatica* in color, shape, and in the presence of a small amount of a metalloid substance. In dried specimens the pilei of *S. silvatica* are pale brown, whereas those of *S. semigloboides* are pale greenish yellow.

STROPHARIA LONGISTRIATA Murrill and STROPHARIA FRAGILIS Kauff.—Sections of Murrill's type were made and the following data recorded: the pileus-trama is covered by a surface layer of vesiculose cells of irregular shape. These cells measure 20–35×10–30μ. Their walls are thin and their contents hyaline. The gill-trama appears to be homogeneous and not otherwise distinctive. Pleurocystidia are unusually abundant, hyaline, fusoid ventricose with somewhat rounded apices, and measure 40–50×9–12μ. In revived material the bases frequently remain partly collapsed. The cheilocystidia are of two types, either similar to pleurocystidia or merely saccate to balloon-shaped. The latter measure 28–36×10–14μ. The basidia are four-spored. The spores measure 7–8×4–4.5μ, are ellipsoid, pale fuscous under the microscope, and are furnished with a rather broad apical hyaline pore. The gills of the type have a distinctly reddish tinge when dried.

Kauffman described *Stropharia fragilis* as having spores 6.5–8×3.5–4(4.5)μ and abundant cystidia. The spores of both species were compared under the microscope and were found to be identical in size, shape, and color. A similar comparison was made of the pleurocystidia and cheilocystidia with the same result. In regard to the pileus-trama both species have the same type of surface covering. In Kauffman's type the cells are a little larger, but no other difference was found. They measure 20–50×10–40μ. This difference is not significant. The gills of Kauffman's type also have a distinctly reddish tinge. As a result of this study of dried specimens, no significant differences between the two were found.

Upon comparing the original descriptions of both species one finds that *S. longistriata* is described as glabrous, radiate-rugose,

isabelline to dark cream on the umbo, whitish to dull brown on the long-striate margin, having crowded lamellae, and a smooth stipe. In its other characters it is the same as *S. fragilis*, which is soon glabrous, radiately wrinkled, fades to "pinkish buff" (which is certainly close to isabelline or dark cream color), and has close gills and a "lacerate floccose silky stipe up to the annulus." Murrill cited *S. longistriata* as common, but did not compare it with any other species of *Stropharia*. Kauffman remarked that *S. fragilis* did not have the habit of *Hypholoma appendiculatum* (to which Murrill compared his species), and he compared it to *Stropharia spintrigera* Fr. Kauffman was obviously thinking of the comparison Fries made of *S. spintrigera* to *H. appendiculatum* when he mentioned the latter. There is no evidence to indicate that Kauffman ever considered Murrill's species in his study of *S. fragilis*. It should also be remembered that Murrill did not have the same concept of *H. appendiculatum* as did Fries. Consequently, no help is obtained from the comparisons they made. The only character out of all those mentioned above which seems at all significant to me is the lacerate floccose silky stipe in one and the smooth stipe of the other.

As a result of three seasons in the field along the coast of Washington, Oregon, and California, I have been able to recognize only one species of fragile *Stropharia* with the microscopic characters of *S. longistriata*. It is common but variable as to color of pileus and development of fibrils on the stipe below the annulus. The pilei vary from "wood brown" to "Mars brown" and in one specimen they were "Mikado brown." The reddish cast, however, is not correlated with any other difference. In respect to the fibrils on the stipe, some collections showed the slightly lacerate condition described by Kauffman, whereas in others the stems were smooth. The smoothness in this species may be caused by the fibrillose coating not becoming lacerated or by the lacerated parts becoming worn away. One can find old specimens with smooth fibrillose stipes, others with smooth almost glabrous stipes, and still others with stem characters such as Kauffman described.

Dr. S. M. Zeller of Oregon State College, Corvallis, Oregon,

was with Murrill at the time *S. longistriata* was being studied. In response to my inquiry Dr. Zeller stated that he also had questioned whether or not *S. fragilis* was distinct from *S. longistriata*, but that he had not seen authentic material of Kauffman's species.

As a result of this study it is apparent that *S. fragilis* should be reduced to synonymy with *S. longistriata*. The question still remains as to whether or not *S. spintrigera* Fr. is the same as Murrill's species. Lange (13) has described a variety, *S. spintrigera* var. *semivestita*, which appears to be almost identical with the American fungus. It differs, apparently, only in its squatty stature and more scaly stipe—two characters upon which, in this instance, I am inclined to place little reliance.

STROPHARIA MAGNIVELARIS Pk. (Pl. XXIV).—Pileus 3–5.5 cm. broad, obtusely umbonate to convex when young, the margin slightly incurved at first, in age broadly convex, plane or with an elevated margin, when young with inconspicuous fibrillose scales near the margin, margin appendiculate with submembranous patches of veil tissue, glabrescent, viscid, color "cream-buff" on the disk and "cartridge buff" toward the margin in young specimens, scarcely changing, "Isabella color" when water soaked, not hygrophanous (water-soaked specimens may fade considerably); flesh firm, whitish, 3–4 mm. at the disk and tapering evenly to the margin, soft, odor and taste mild; lamellae broadly adnate and usually toothed, becoming depressed around the stipe at maturity, close, 30–36 reach the stipe, 3 tiers of short individuals, broad (5–7 mm.), "ivory yellow" when young, soon "benzo brown," edges even; stipe 6–9 cm. long, 4–7 mm. thick, equal or slightly enlarged above, hollow, white to whitish or in age sordid brownish toward the base, somewhat fibrillose to subscaly below the annulus, glabrous above; annulus submembranous or merely fibrillose, whitish, usually very ragged, evanescent; spores somewhat ellipsoid, 11–14(15)×6–8μ, with an apical hyaline germ pore; basidia four-spored; cheilocystidia 30–40×4–5μ, hyaline, smooth, filamentous; pileus-trama homogeneous beneath a thin gelatinous pellicle; pleurocystidia not differentiated.

Scattered to gregarious on sandy soil under alder on river flats, Hoh River, Olympic National Park, May 19 (13170); Lake Quinault, May 17 (13452); Hoh River, May 19 (13551) and May 20 (13606); Lake Quinault, May 21 (13646); near Graves Creek Inn, May 23 (13700); along the Hoh River, June 6 (14138); along the Elwha River, June 8 (14167) and June 16, 1939 (14407). All collections were made in the Olympic Mountains of Washington.

The species is closely related to *S. ambigua* (Pk.) Zeller, but is much smaller and has larger spores. In my collections the annulus was ragged and soon evanescent. In the type it is ample and gave rise to the specific name. I do not regard this difference as taxonomically significant, however, since *S. ambigua* is noted for just such a variation as this. Sterile specimens of *S. magnivelaris* were not uncommon in the Olympics during the spring of 1939. The microscopic characters of the type are not repeated here because they are exactly the same as those given in the description of the Washington collections.

TRICHOLOMA IONIDES (Fr.) Quél.—Pileus 3–6 cm. broad, obtuse, soon plane, the margin long remaining inrolled, finally becoming elevated and often plicate-crenate, opaque, surface dry, very minutely pruinose-tomentose at first under a lens, appearing unpolished to the naked eye, color at first evenly "slate-violet" to "dark heliotrope gray," fading slowly to a dull violaceous gray, finally nearly "ecru-drab," water-soaked individuals fading as if subhygrophanous; flesh white, sometimes violaceous under the cuticle, firm and brittle, odor and taste mild; lamellae narrow, adnate or slightly sinuate, whitish or "ivory yellow" at first, in age pale sordid yellowish, edges even; stipe 3–5 cm. long, 8–15 mm. thick, equal or enlarged slightly above, sometimes clavate at first, hollow, flesh white, surface smooth but becoming somewhat fibrillose, concolorous with the pileus or more grayish, often with grayish mycelium around the base; spores 5–6×2.5–3μ, smooth, narrowly ellipsoid, yellowish in iodine; basidia four-spored; cheilocystidia and pleurocystidia not differentiated; gill-trama homogeneous; pileus-trama homogeneous, pellicle formed of narrow compactly arranged hyphae.

Gregarious under *Picea sitchensis*, Crescent City, California, Nov. 12 (8647) and Nov. 21, 1939 (8975). Although previously reported from various localities in the United States this species is not at all well characterized in our literature. It is readily distinguished from *Tricholoma onychinum* by its colors, lack of a differentiated cuticle over the pileus, and by the longer spores. From *Tricholoma persicolor* Fr. sensu Ricken (21), which was reported (26) for Michigan in 1937, it differs chiefly in color and less fragile consistency. Murrill's account of *Melanoleuca ionides*, to judge from his description, must apply to another species, possibly *Tricholoma onychinum*. I have not examined his specimens.

TRICHOLOMA ONYCHINUM (Fr.) Gillet.—Pileus 2.5–4.5 cm. broad, broadly convex to plane, the margin inrolled at first and often remaining decurved, surface dry, dull and unpolished (appearing minutely innately fibrillose-pruinose under a lens), in age glabrous and sometimes moist, not hygrophanous, fading very slowly after being water soaked, firm, color evenly "dark livid brown" to "dark vinaceous-brown" (dark purplish brown), fading slowly and becoming more purplish; flesh firm to subcartilaginous, moderately thick, sordid yellowish, odor and taste none; lamellae adnexed to sinuate, crowded, narrow, becoming moderately broad, "yellow ochre" in young and old specimens, edges even; stipe 2–4 cm. long, 3–8 mm. thick, equal or tapered at the base, base slightly strigose, solid, flesh yellowish, surface covered by a dense fibrillose pruinose coating of grayish vinaceous fibrils, color pale grayish rose; spores 3.5–4×2.5μ, ellipsoid, smooth, yellow in iodine; basidia four-spored; cheilocystidia and pleurocystidia not differentiated; pileus-trama with a differentiated surface layer of enlarged cells with vinaceous contents, the cells 10–30×10–15μ, variously shaped and interwoven, not forming a typical palisade, the remainder of the trama homogeneous and compact, the hyphae 5–6μ thick.

Singly to scattered under pine, McKenzie Pass, Oregon, 4500 feet elevation, Oct. 18, 1937 (7953); Kirby, Oregon, Nov. 20, 1937 (8906); Grants Pass, Oregon, Nov. 26 (9082); Siskiyou Fork,

Smith River, California, Nov. 30, 1937 (9233); Oregon Caves, Oregon, Dec. 1, 1937 (9309).

The dark purplish brown to reddish brown pilei and yellow gills are very distinctive. The structure of the pileus-trama is rather curious for a *Tricholoma*. It is very similar to that found in most species of *Psathyrella*, but is not correlated with a fragile consistency of the entire fruiting body as in that group. In Lange's (11) account of the genus, *Tricholoma onychinum* would have to be classed in the subgenus Dermoloma.

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PLATES I–XXXII

Collybia olympiana Smith. × 1 (large specimens).

Hygrophorus subalpinus Smith. × 1.

Hygrophorus vernalis Smith. × 1.

Fig. 1. *Mycena insignis* Smith. × 1.

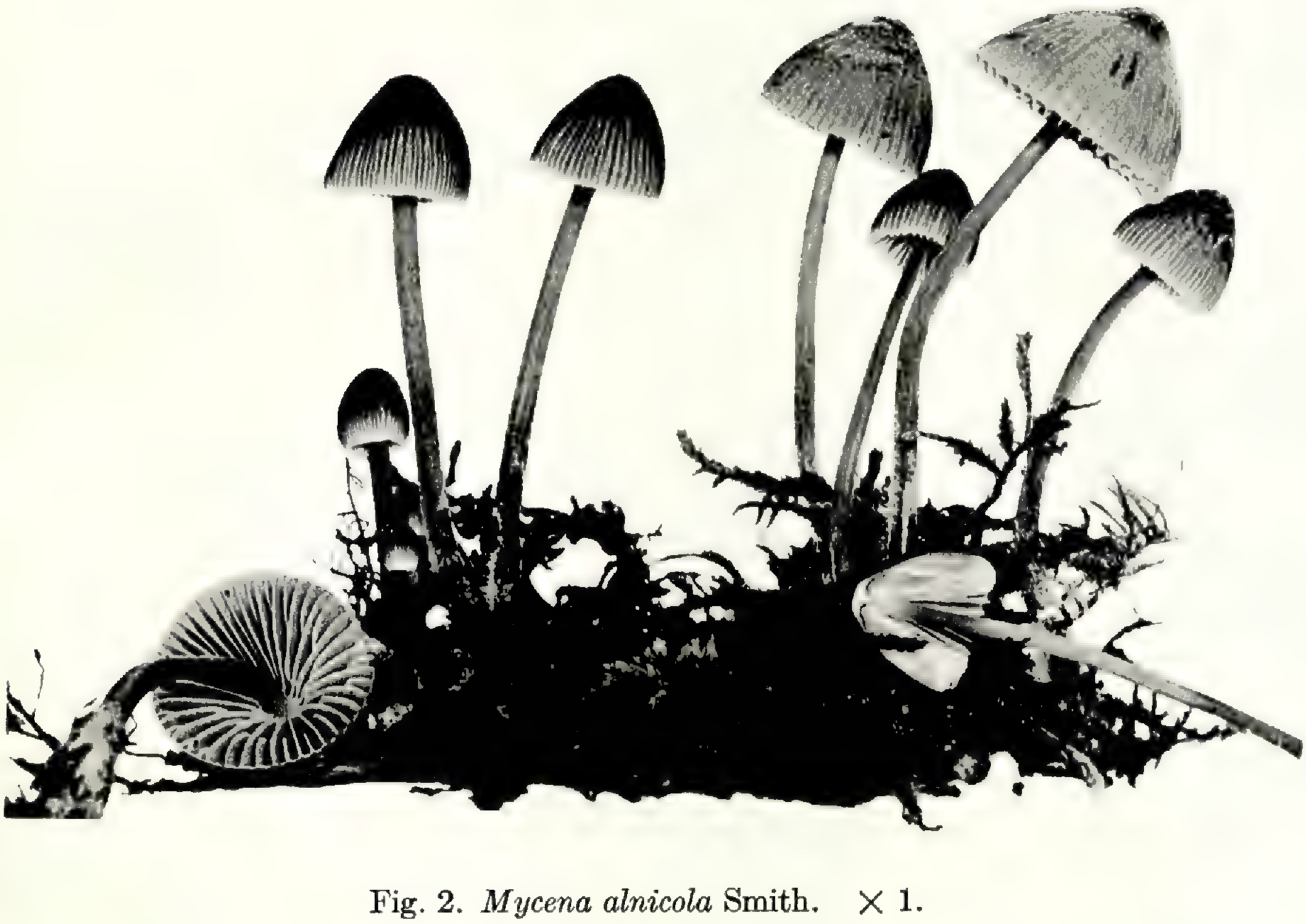

Fig. 2. *Mycena alnicola* Smith. × 1.

Mycena hudsoniana Smith. × 1.

Naucoria vernalis Pk. × 1.

Fig. 1. *Omphalia hohensis* Smith. × 2.

Fig. 2. *Omphalia viridis* (Fl. Dan.) Lange. × 1.

Hypholoma tsugicola Kauffman. × 1. (Photographed by C. H. K.)

Fig. 1. *Hypholoma silvaticum* (Pk.) Smith. × 1.

Fig. 2. *Psathyrella luteovelata* Smith. × 1.

Psathyrella carbonicola Smith. × 1.

Psathyrella olympiana Smith. × 1.

Fig. 1. *Psathyrella coprobia* (Lange) Smith. × 1.

Fig. 2. *Psathyrella michiganensis* Smith. × 1.

Psathyrella atrifolia (Pk.) Smith. × 1 (~~short~~ long-stiped form).

Psathyrella atrifolia (Pk.) Smith. × 1 (~~long~~ short-stiped form).

Psathyrella Barlae (Bres.) Smith. × 1.

Psathyrella chondroderma (Berk.) Smith. × 1.

Psathyrella longipes (Pk.) Smith. × 1.

Psathyrella semivestita (Berk. & Br.) Smith. × 1.

Psathyrella spadiceogrisea (Fr.) Smith. × 1.

Psathyrella subnuda (Karst) Smith. × 1.

Stropharia silvatica Smith. × 1.

Stropharia Kauffmanii Smith. × 1.

Stropharia magnivelaris Pk. × 1.

The drawings for Pls. XXV–XXXII were made with the aid of a camera lucida. The cystidia and cells from the surface of the pileus are reproduced 750× natural size and the spores 1650×.

PLATE XXV

Mycena alnicola:

FIG. 1. Five pleurocystidia.

FIG. 2. Eight spores.

FIG. 3. Five cheilocystidia.

M. hudsoniana:

FIG. 4. Seven spores.

FIG. 5. Two pleurocystidia and two cheilocystidia.

M. insignis:

FIG. 6. Nine cheilocystidia.

FIG. 7. Ten spores.

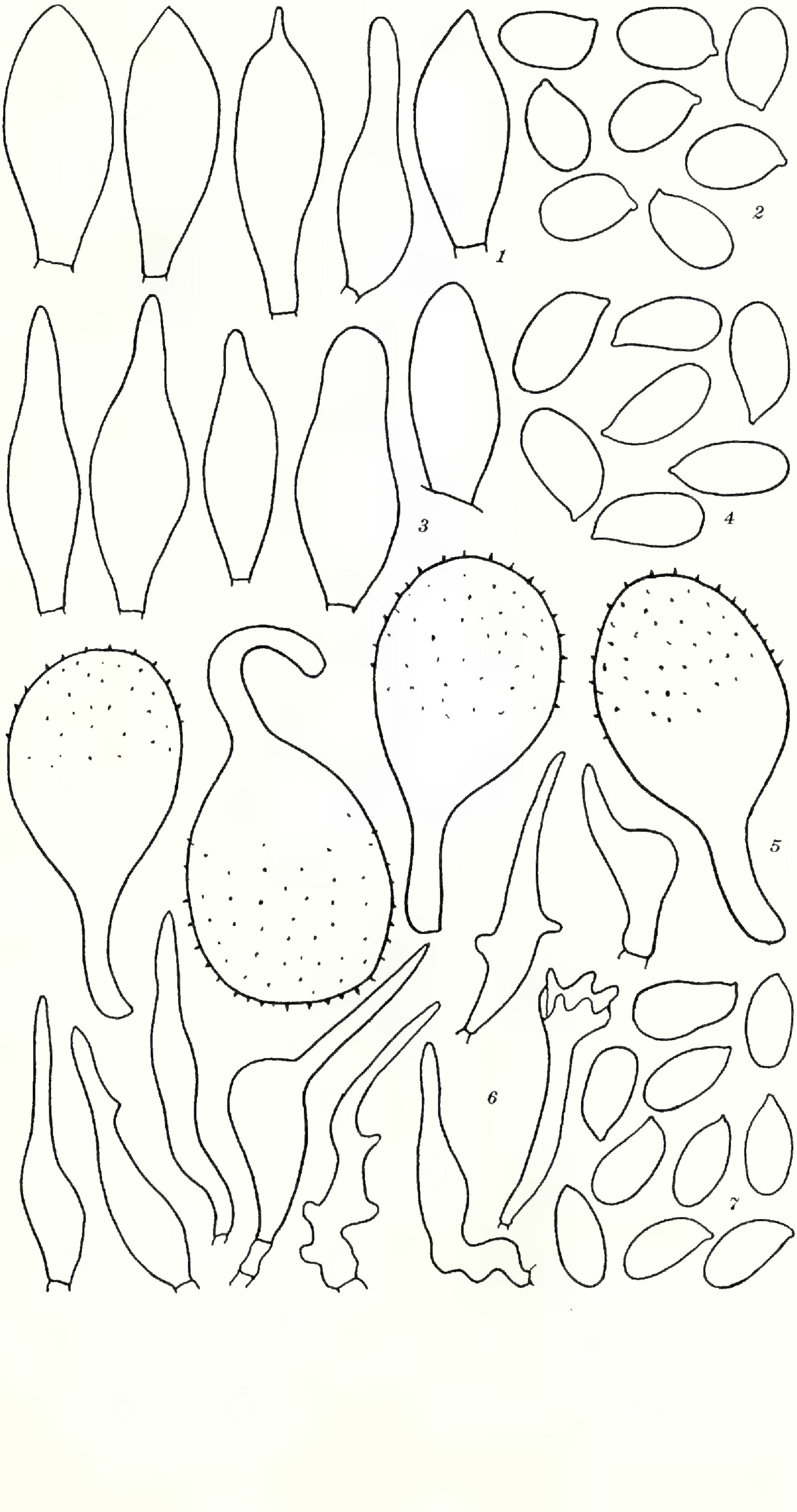
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PLATE XXVI

Psathyrella atrifolia:

FIG. 1. Four pleurocystidia.
FIG. 2. Seven spores.
FIG. 9. Two cheilocystidia.

P. canoceps:

FIG. 3. Four cheilocystidia.
FIG. 4. Seven spores.

P. chondroderma:

FIG. 5. Three pleurocystidia.
FIG. 6. Enlarged cells from the surface of the pileus.
FIG. 7. One cheilocystidium.
FIG. 8. Eight spores.

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PLATE XXVII

Hypholoma fragile (Painted Post collection):

FIG. 1. Four cheilocystidia.

FIG. 2. Seven spores.

H. fragile (Star Lake collection):

FIG. 3. Six spores.

FIG. 11. Five cheilocystidia.

Psathyrella oblongispora:

FIG. 4. Two pleurocystidia.

FIG. 5. Four cheilocystidia.

FIG. 6. One cheilocystidium.

FIG. 7. Eight spores.

FIG. 8. Three pleurocystidia.

P. longipes:

FIG. 9. Five spores.

FIG. 10. Three cheilocystidia.

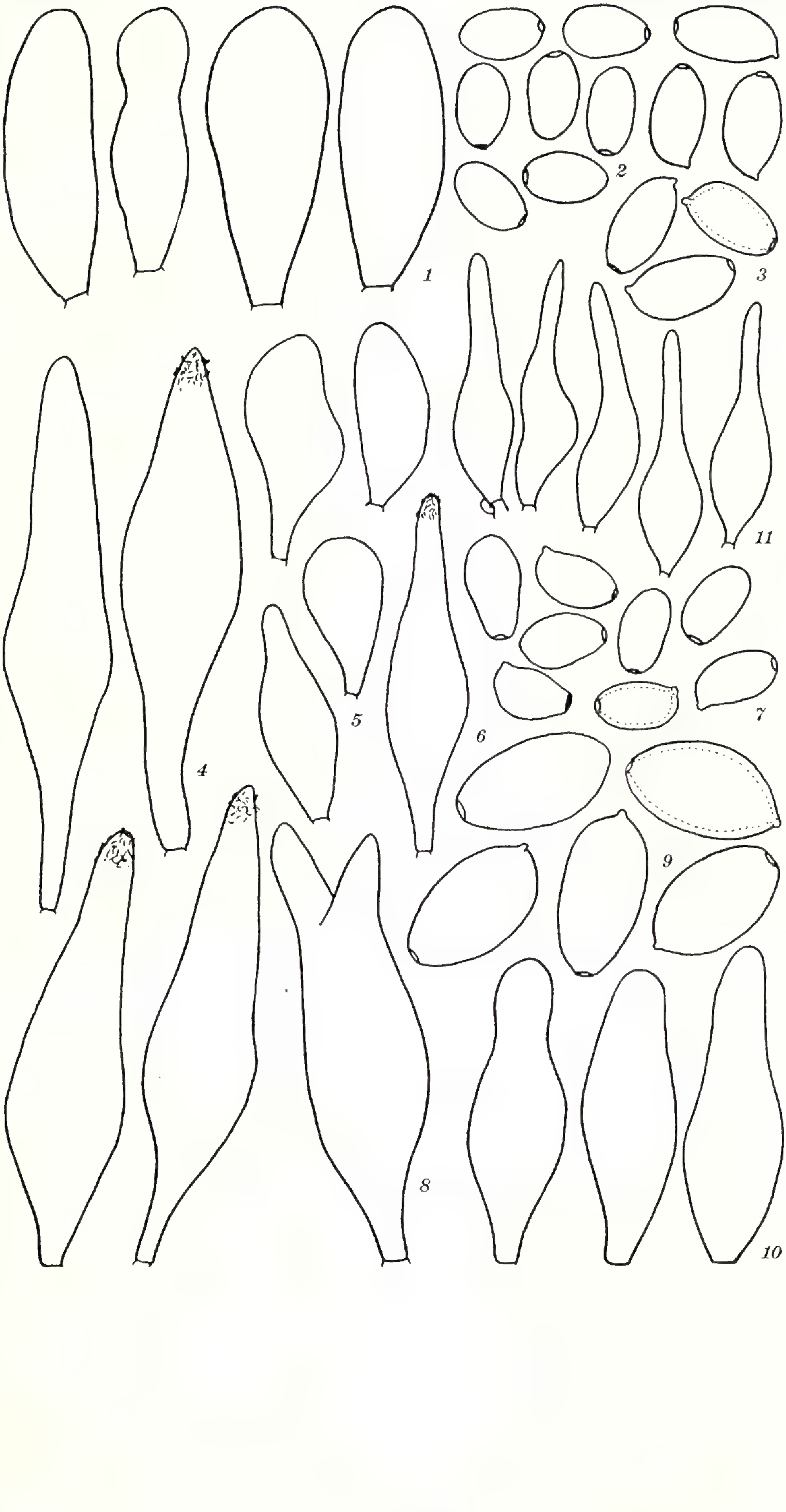
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PLATE XXVIII

Psathyrella madeodisca (from Michigan):

FIG. 1. Four pleurocystidia.

FIG. 2. Three cheilocystidia.

FIG. 4. Eight spores.

P. madeodisca (type):

FIG. 3. Six spores.

FIG. 5. Four pleurocystidia.

P. similis:

FIG. 6. Two pleurocystidia.

FIG. 7. Three cheilocystidia.

FIG. 8. Cells from the surface of the pileus.

FIG. 9. Eight spores.

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PLATE XXIX

Psathyrella michiganensis:

FIG. 1. Three cheilocystidia.

FIG. 2. Cells from the surface of the pileus.

FIG. 3. Five spores.

P. carbonicola:

FIG. 4. Eight spores.

FIG. 6. Five pleurocystidia and cheilocystidia.

P. luteovelata:

FIG. 7. Eight spores.

FIG. 8. Three pleurocystidia.

P. olympiana:

FIG. 5. Seven spores.

FIG. 9. Four pleurocystidia.

P. cuspidata:

FIG. 10. Eight spores.

SMITH

PLATE XXIX

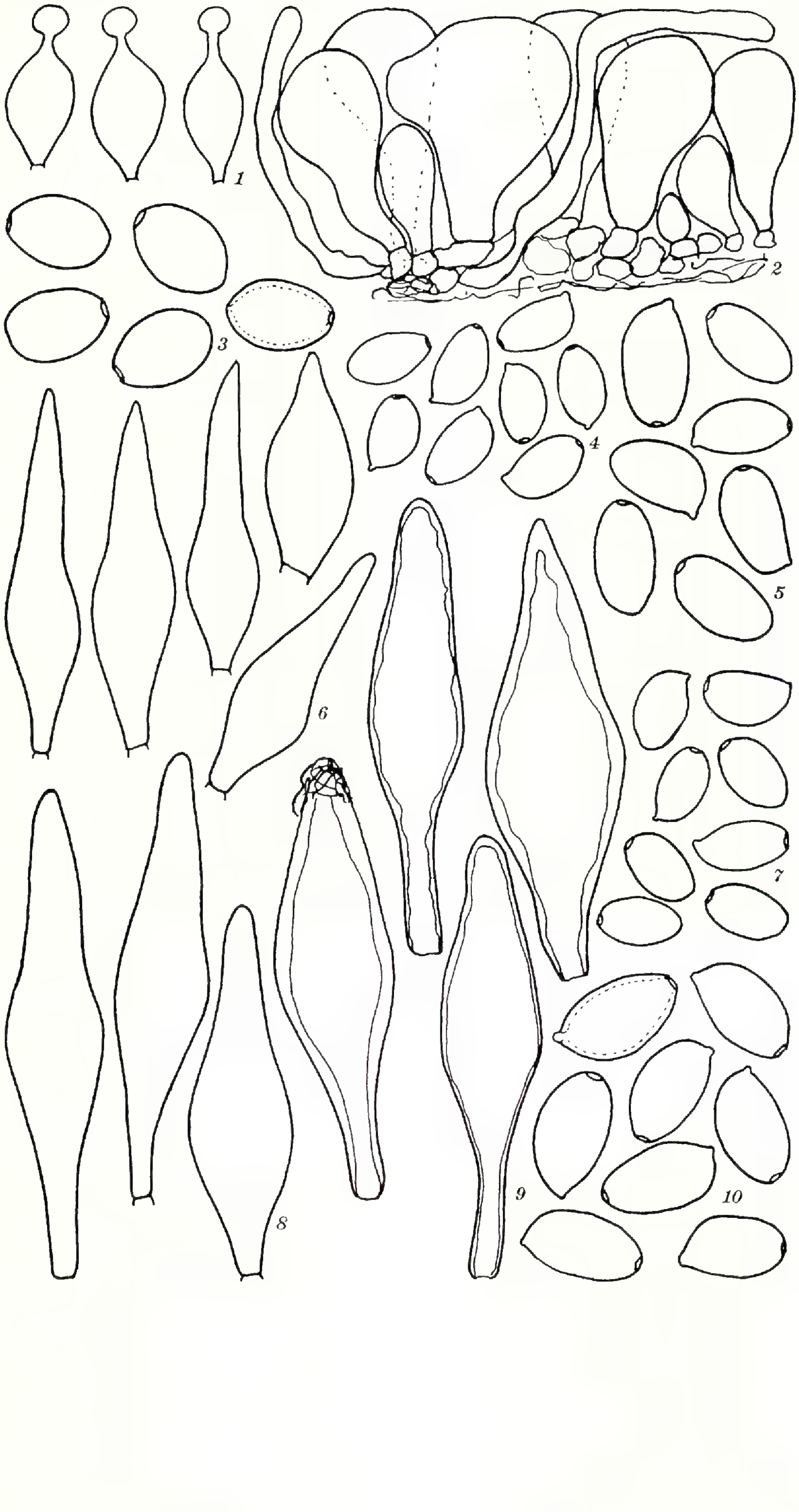

PLATE XXX

Psathyrella olympiana:

FIG. 1. Cells from the surface of the pileus.

P. cuspidata:

FIG. 2. Two pleurocystidia.

FIG. 5. Two pleurocystidia.

P. Barlae:

FIG. 3. Two pleurocystidia.

FIG. 4. Three cheilocystidia.

FIG. 6. Five spores.

P. bifrons:

FIG. 7. Three cheilocystidia.

FIG. 8. Seven spores.

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PLATE XXXI

Psathyrella coprobia:

FIG. 1. Four pleurocystidia and cheilocystidia.

FIG. 2. Seven spores.

P. frustulenta:

FIG. 3. Seven spores.

FIG. 4. Three pleurocystidia.

FIG. 5. Four cheilocystidia.

P. obtusata:

FIG. 6. Three pleurocystidia.

FIG. 7. Two cheilocystidia.

FIG. 8. Five spores.

P. pennata (Kauff. collection):

FIG. 9. Two pleurocystidia.

FIG. 10. Eight spores.

SMITH

PLATE XXXI

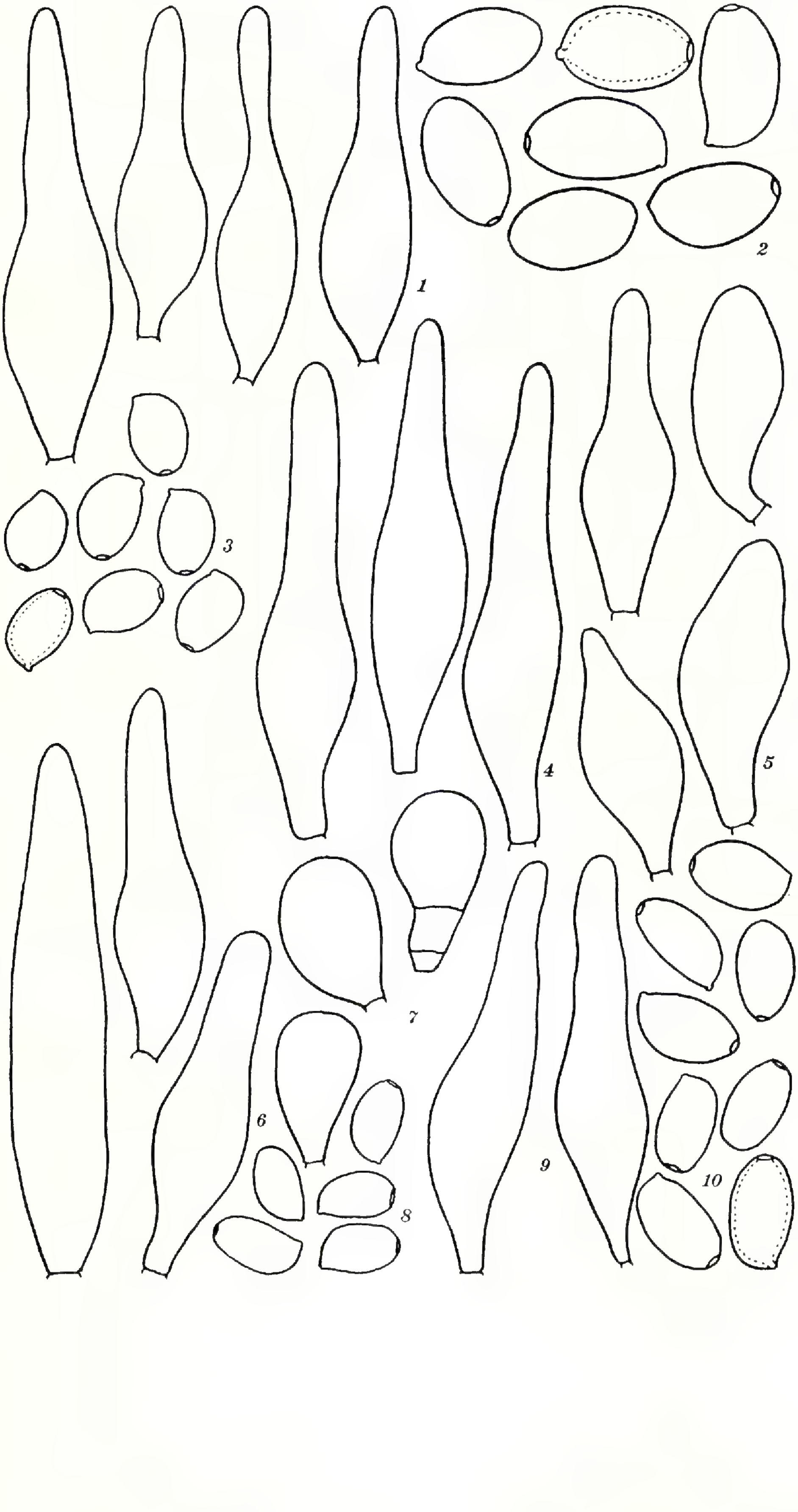


PLATE XXXII

Psathyrella semivestita:

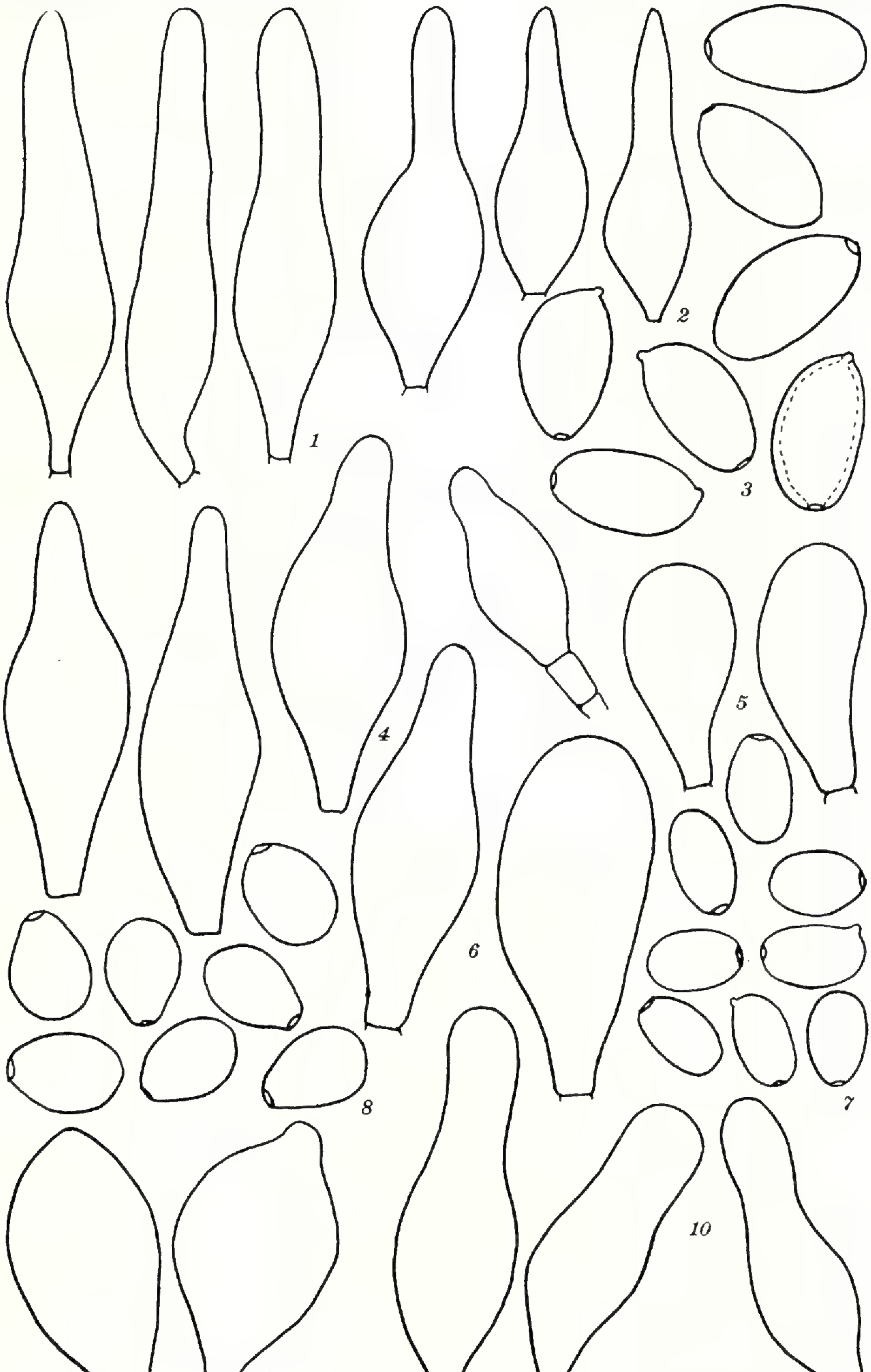
FIG. 1. Three pleurocystidia.
FIG. 2. Two cheilocystidia.
FIG. 3. Seven spores.

P. spadiceogrisea:

FIG. 4. Pleurocystidia.
FIG. 5. Three cheilocystidia.
FIG. 6. Two cheilocystidia.
FIG. 7. Eight spores.

P. subnuda:

FIG. 8. Seven spores.
FIG. 9. Two cheilocystidia.
FIG. 10. Three pleurocystidia.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CONTRIBUTIONS FROM THE UNIVERSITY OF MICHIGAN HERBARIUM

No. 1. Rusts from British Honduras, by Edwin B. Mains.
Notes on Agarics from British Honduras, by Alexander H. Smith. 28 pp., 2 pls. Price, $.25. (Issued May 23, 1939.)

No. 2. Studies in the Genus *Cortinarius* I, by Alexander H. Smith. 42 pp., 12 pls. Price, $.35. (Issued June 30, 1939.)

No. 3. Revision of the American Celastraceae I. Wimmeria, Microtropis, and Zinowiewia, by Cyrus Longworth Lundell. 46 pp., 10 pls. Price, $.40. (Issued Aug. 10, 1939.)

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